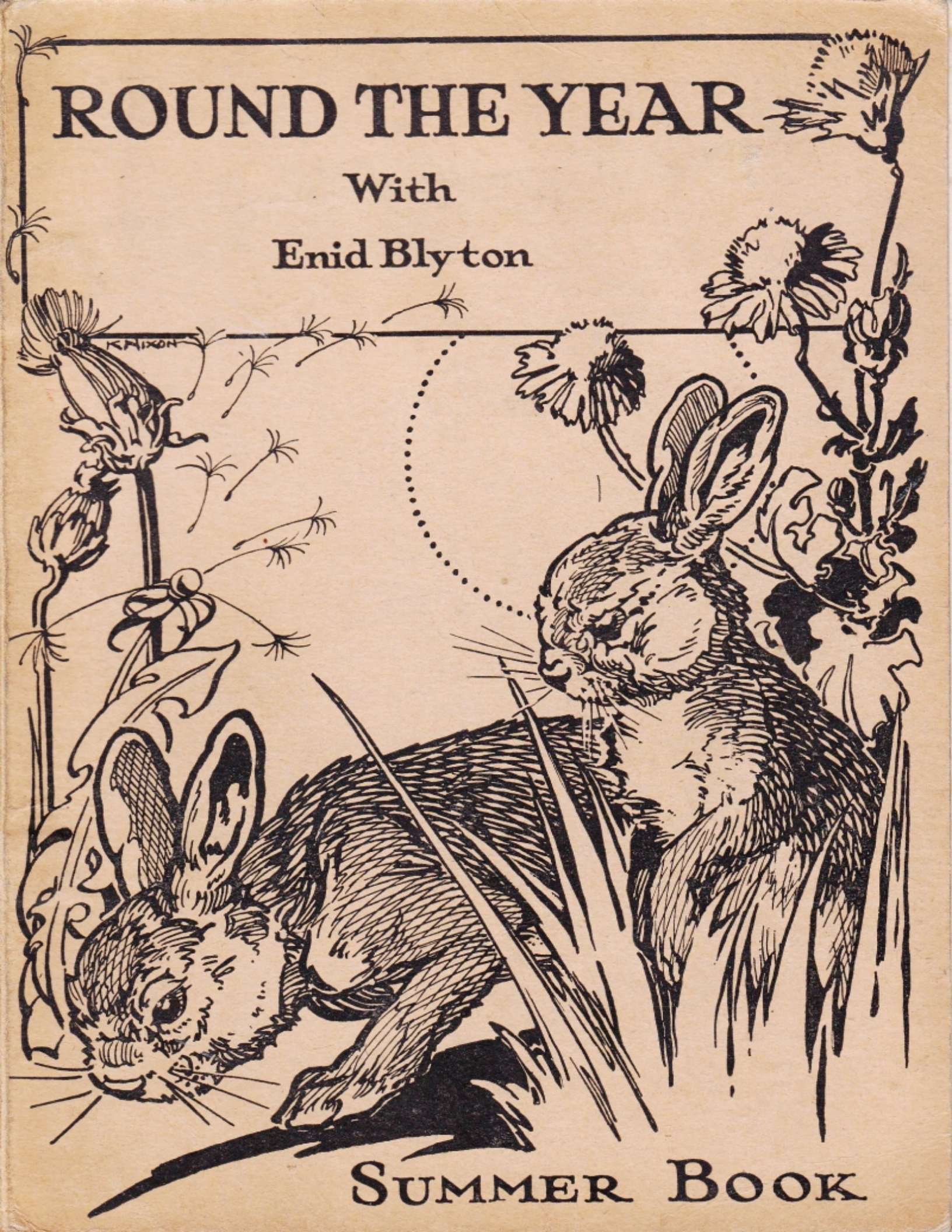
ROUND THE YEAR

With

Enid Blyton



SUMMER BOOK

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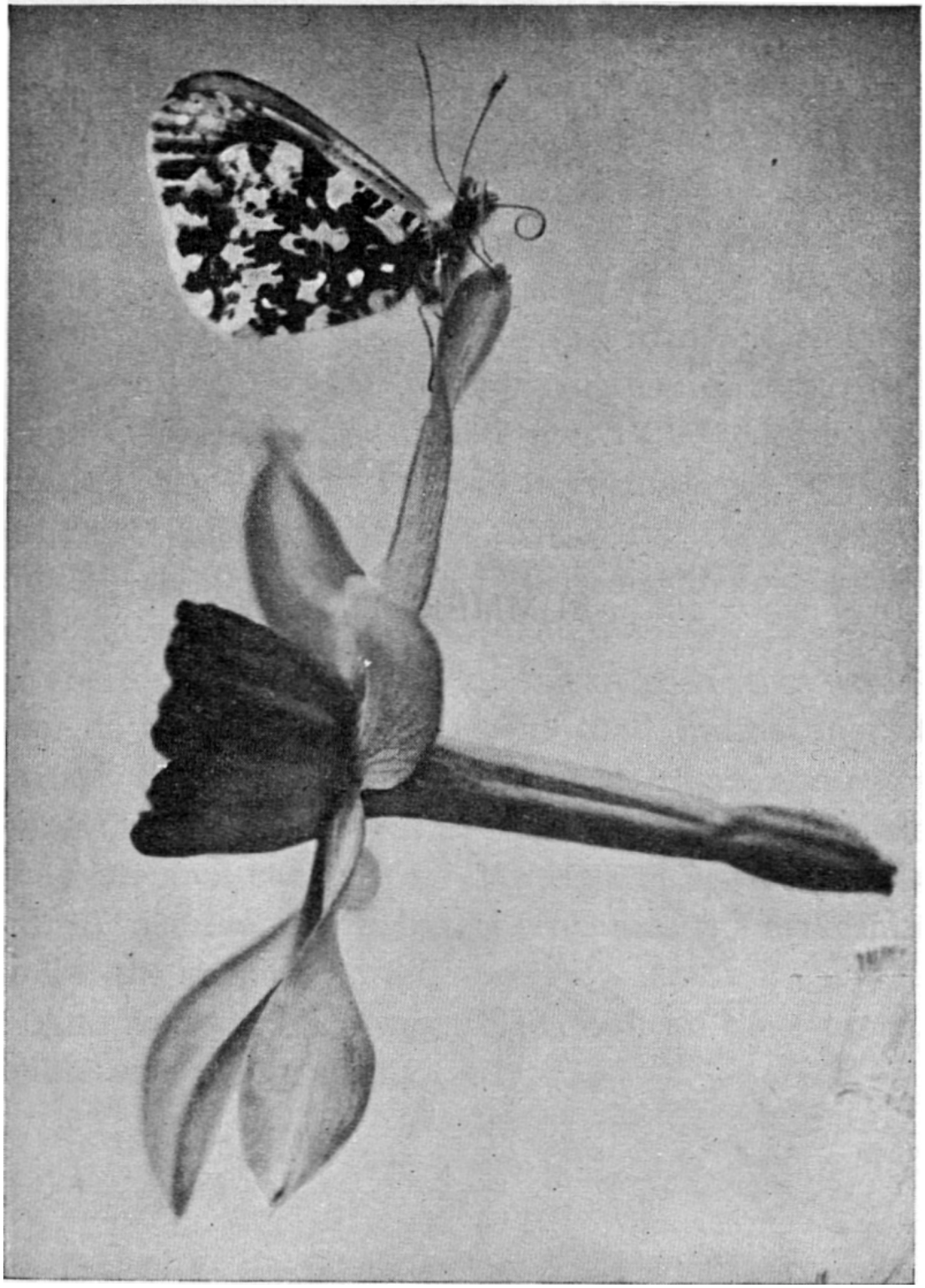
SUMMER TIME



THE BUTTERFLY IS UNCOILING THE LONG TONGUE WITH WHICH IT SUCKS HONEY FROM THE FLOWERS

ROUND THE YEAR

WITH

ENID BLYTON

SUMMER TIME

EVANS BROTHERS LIMITED, LONDON

ENID BLYTON'S NATURE BOOKS

ROUND THE YEAR WITH ENID BLYTON

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IN FOUR BOOKS

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SUMMER
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DEAR BOYS AND GIRLS,

I wish you could come with me and walk over the hills, through the fields, and down by the river, finding a hundred exciting or beautiful things by the way. I should like to take you fishing in the ponds, and fill your jars with snails and tadpoles. I should like to help you to make a fine bird-table, or to prepare a splendid aquarium. I should like to give you a garden of your own, and show you how to make it a place of bright colours and sweet scents.

But I cannot do all these things—so instead I have written these four books for you, so that you may read them and do for yourselves all the things I would like to do with you. We will go round the year together, and you must discover with your teacher and your friends all the exciting things there are to be found in Nature study.

Good luck to you in all your Nature work, and may you find as much delight in using these books as I found when writing them for you!

Enid Blyton

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CHAPTER 1
THE TALE OF THE TADPOLE

I am sure that most of you will be able to read the Tale of the Tadpole in your aquarium tank. Probably you have quite big tadpoles by now and know a good deal of the life-history of the funny little creatures.

Who knows why the frog puts her eggs into jelly? It seems rather a queer thing to do, doesn't it? What a lot of eggs a frog lays! You have seen the spawn floating at the top of the water in great masses, I expect.

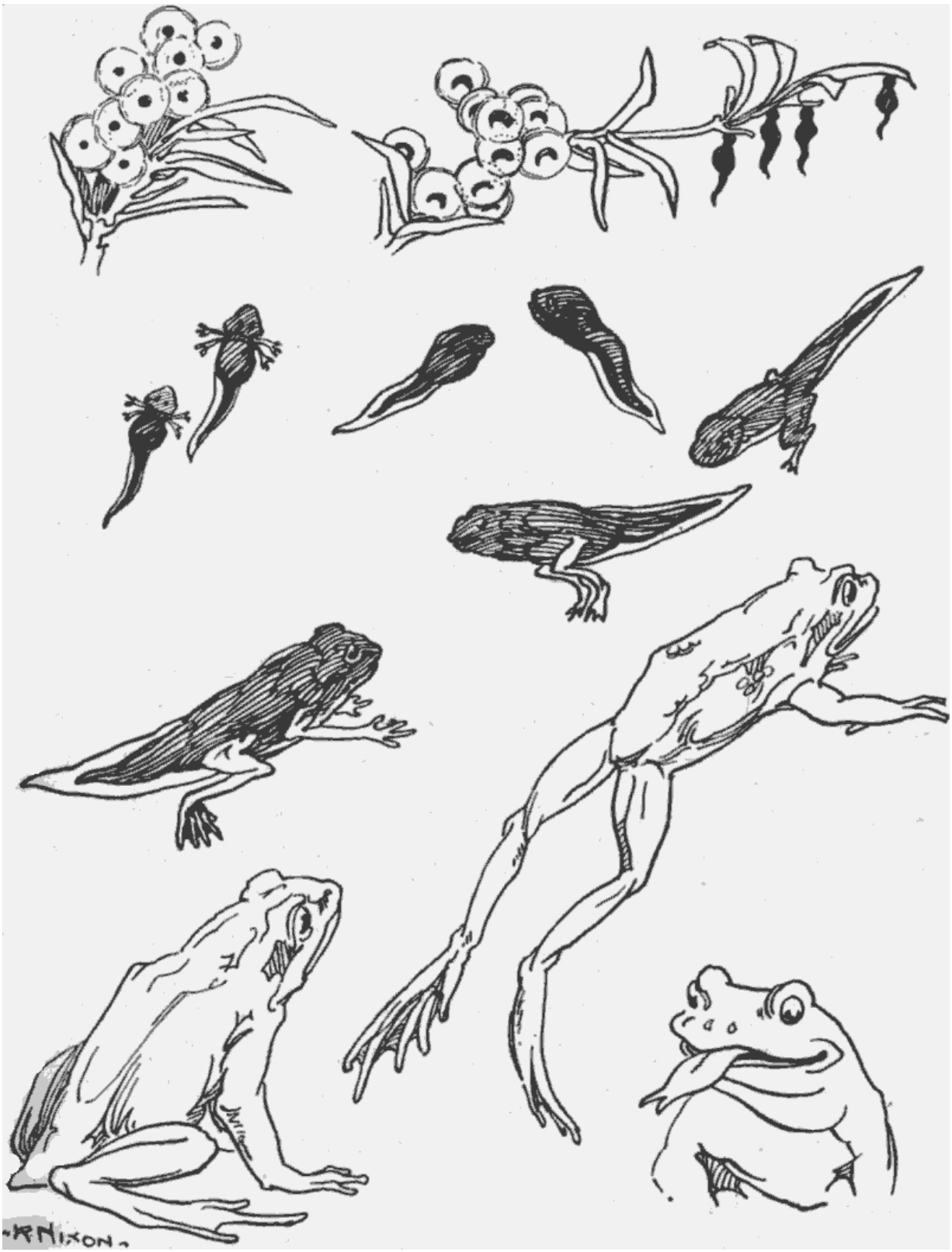
Have you picked up—or tried to pick up—any frog-spawn in your hands? It is so difficult! It slips out of your fingers and flops back into the water. It is too slippery to hold—and too slippery for any hungry creature in the water to eat! A tiny hatching tadpole would be a tasty mouthful for, say, a fierce water-beetle—so the jelly is put round the egg to guard it. Ducks are about the only things that can eat frog-spawn—and even then it sometimes slips out of their beaks and they have to try again! It is no good looking for little water-creatures in a pond where ducks live, for the ducks eat everything they find!

The jelly always floats to the surface, so that the sun can shine down on it and hatch the eggs. At first the little black eggs in the middle of each blob of jelly are quite round—then they get longer, like tiny sausages, or fat commas—and then at last the jelly begins to fall to pieces and the little black specks float out. They are the tiniest of tadpoles, just able to wriggle about. They hold on to the jelly at first, and then, when they are stronger, they float to the nearest water-weed.

How queer they look, these wriggling tadpoles! They have a long head and body ending in a tail. We cannot see any eyes or mouth. They cling to the water-weed by means of little suckers under their heads. I expect you have seen them doing that in your aquarium.

In a short time we can see yet another change in their shape. The head becomes distinct from the body, a proper little mouth forms, and something grows out of the tadpole's sides—four feathery-looking things. What are

they? They are gills to help the tadpole breathe whilst it is in the water. Have you seen them?



THE LIFE-STORY OF THE FROG, FROM EGGS TO FULL-GROWN FROG

Our tadpoles soon learn to swim about all over the place, and we can watch them feeding on the water-weed in our aquarium. They grow bigger and fatter. The feathery-looking gills disappear! They gradually shrivel up, because better gills grow inside their bodies, and they do not need the outside ones any more. Perhaps you have seen all this happen already, and your tadpoles are now big healthy-looking creatures, round and fat. You really cannot tell where the head ends and the body begins!

They are not quite so black now. Look for their bright eyes. Can you see them? They need other food than the water-weed—they like the little water-fleas and other tiny creatures almost too small for us to see, but which live in crowds in pond-water. That is one reason why you must put pond-water in your aquarium, and not tap-water. The tap-water has no water life in it, but the pond-water has plenty. If you will put a cupful of fresh pond-water into your tank once a week you will find that your tadpoles like it very much and flourish well. The tank-water evaporates, so you must keep up the water level.

Tadpoles also like a bit of raw meat occasionally. Tie a piece to a string and hang it over the side of the tank for a day or two each week. You will see the tadpoles come and nibble at it with great enjoyment. Take it out before you go home after school. If any bit of it falls off, do not leave it to decay in the water. Spoon it out.

Tadpoles will be frogs when they grow up, so they must grow legs. Watch your tadpoles. One day you will see that one or two have tiny back legs growing. Ah, now they really begin to look more frog-like, do they not?

One of the differences between frog and toad tadpoles is that the *front* legs of the toad are noticed first. The front legs of the frog-tadpoles are growing too, but they are hidden at first behind the gill-cases, and we do not notice them.

What funny little legs they are! Have they toes? How many? Does the tadpole use his new legs to help him swim, or does he still use only his big tail? Watch and see.

“Oh,” you will say one day, “his tail seems to be much shorter!” So it is. It is disappearing! The tadpole’s body is using it up, drawing out the goodness in it, making it become smaller and smaller—until at last there really isn’t any left! And when that happens we cannot call the tadpole a tadpole any longer; he is a tiny frog. He could sit on a sixpenny bit easily,

he is so small. He has four little legs with toes on the end, and his body is ridged on the back like a grown frog's.

The tiny frog does not like to keep in the water all the time—he keeps bobbing up to the surface and sticking his blunt nose out. He does not breathe with gills now, but with lungs, like us—he is an air-breathing creature, not a water-breathing one. What a number of changes he has had in his short life! He is soon going to become a land-creature now, so he practises breathing the air at the top of the pond. Or, if he is in your aquarium, he clambers up the stones you have put there, and sits on the one you have allowed to peep out of the water. He is very comfortable there, and he will sit and blink at you (for he has grown eyelids now, too!) and enjoy himself.

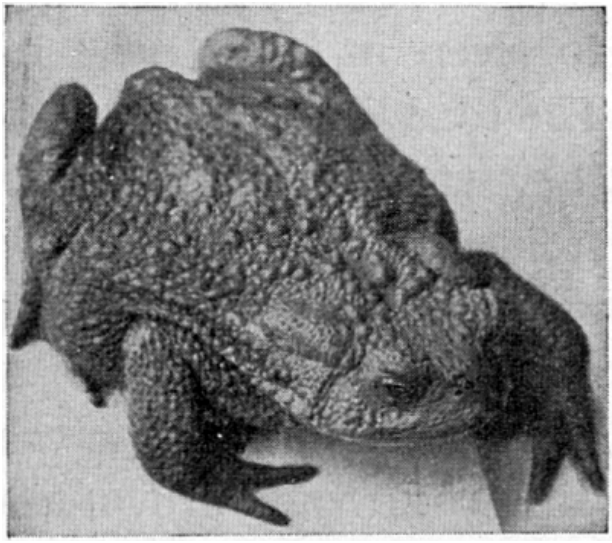
You cannot very well feed small frogs, for they need flies and other insects, so the time has come for you to say good-bye to him and put him back in the pond, with all the other small frogs that have grown up there since the spring-time. What a large world the pond seems to him after his sheltered aquarium! How full of dangers! I expect for the first few days our little frog has a great many frights.

If it is hot, dry weather the small frogs remain in the pond or in the muddy places near it. They are waiting for a good rainstorm before starting out on an exciting journey to find a home for themselves. One day the rain pours down and soaks everything. Good! That is the signal for the little frogs to leave the pond and go to the ditches and meadows.

Each little frog finds a nice damp spot for itself. Some hide under leaves. Some crawl under stones. Some squat at the bottom of ditches. And there they stay till they are hungry and the night is cool and dark. Out they come and hunt for slugs or any other tasty creature. They are fond of flies, too, and these they catch in the daytime, when any unwary insect comes near their hiding-place. How do they catch flies? Have you ever seen a frog or toad catching one?

Both frogs and toads have a queer tongue. It is fastened at the *front* of their mouths instead of at the back like ours, and so they can flick it in and out a long way. It is sticky at the tip, and when the frog sees a fly perching near by he flicks out his ready tongue, the fly sticks to the tip, the frog draws in his tongue—and swallows the fly! It is all done so quickly that it seems like magic.

Do you know the difference between a frog and a toad? The frog is smoother-skinned, and he has a startling habit of suddenly jumping high into the air. This is useful to him when an enemy sees him. The toad has a rough, warty skin, and he crawls, instead of jumping. On his back he has a great many little bags holding a stinging liquid, and if an enemy tries to bite him the toad squeezes out his poison, which tastes so nasty that his enemy leaves him in disgust. The toad lays eggs in long *strings* of jelly, not in masses, like the frog.



A TOAD IS A GOOD FRIEND IN OUR GARDEN, FOR HE EATS SLUGS AND MANY OTHER INSECT PESTS

In the autumn the frogs and toads find damp places to sleep in. The frog likes the bottom of a pond. The toad likes a hiding-place under a big stone. There they stay all the cold winter through, hearing and seeing nothing. In the warm spring-time they wake up—and once more the ponds become full of frog-spawn, and the Tale of the Tadpole begins all over again! Our little one-year-old frogs do not lay eggs—they are not grown-up yet, and will not be full-grown frogs until they are three or four years old—but the old frogs lay their eggs, and once again we see hundreds of little tadpoles wriggling gaily.

THINGS TO DO

1. Look at your tadpoles carefully. Draw one. When you notice any difference, draw one again. Put dates each time.
2. Tell the Tale of the Tadpole shortly, from the spawn to the frog.
3. What is the difference between a toad and a frog? Do you know one from the other? If you do not, try to find out this summer.
4. Tame a toad if you can. He likes to be tickled on his back with a straw.
5. Look at the eyes of a toad. They are unexpectedly lovely.

CHAPTER 2
HOW NEW FLOWERS ARE MADE

In this chapter I am going to tell you how it is that flowers are able to make seeds which in their turn grow into flowers themselves.

First of all, look at a flower carefully. I do not know what flower you have before you, but it is sure to have all the things I am going to talk about. Look underneath the flower. What do you see there? Do you see some green leaf-like things? Do you remember that when the flower was in bud these green sepals, as we call them, folded over the flower and protected it from cold and rain? Have you a bud there? Look at it and see if the sepals are doing as I say.

What comes above the green sepals? Yes, you all know—the petals.

Now look inside the flower—what are those yellow-headed things standing round the middle of the flower? They are stamens, and most of you know that they hold pollen. Do you remember shaking the yellow pollen-powder out of the hazel catkins? It came out in a cloud. Touch the stamen heads with your finger. If they are ripe you will find that the tip of your finger is yellow. On page 21 is a picture of pollen grains showing what they look like under a microscope.

Now look right into the middle of the flower. You will see a green thing—the pistil. What is it like? Do you see its green tip? Touch it. Does it feel sticky? Has it a neck running down to the bigger part we call the seed-box? The tip is the *stigma*, the neck is the *style*, and the seed-box the *ovary*.

You might think that the most important parts of a flower were the protecting sepals, or the bright, showy petals, and that they could well do without the inner parts. But it is just the other way about—the stamens and the pistil are the most important parts, and sometimes a plant does without its sepals or petals—think of the flowers of grass, which are only stamens and pistil, and have no petals or sepals at all. But a plant cannot do without its stamens or pistil, for if it did it could never make seed.

That is why the stamens and the pistil are so important to the plant—they make seed; and without seeds to grow new plants what would happen?

We should have a very bare world, shouldn’t we!

Now I will tell you how a seed is made. You know that the head of the stamen (the anther) holds pollen powder. This is in the form of very tiny grains, all of which want to go to a pistil of a flower—if possible a pistil of *another* flower, not their own flower. How can the pollen go where it wants to? It cannot fly off by itself, so it must get something to help it. Perhaps, if the flower blossoms early in the spring, before insects are about, it will ask the wind to help its stamens. If it flowers now, when many bees, butterflies and other insects are everywhere, it will ask some of *those* to carry its pollen from one place to another. Somehow or other the flower will see that its pollen is carried away to where it wants to go.

A HONEY-BEE GATHERING POLLEN FROM A FLOWER. ITS VISIT WILL HELP THE FLOWER TO MAKE SEEDS

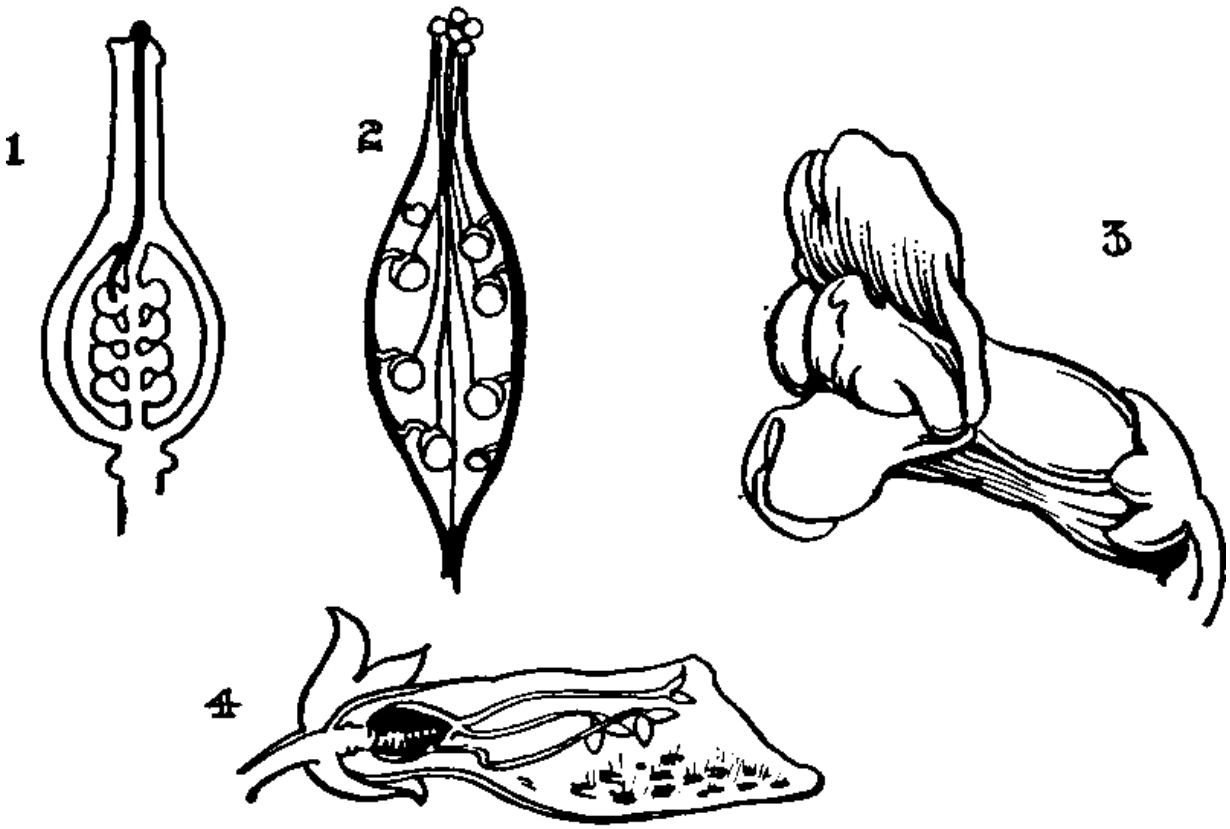
We will suppose that a bee carries away the pollen. It comes looking for honey in the flower, and rubs against the ripe stamens. They spill their pollen-grains on to the bee’s back (have you seen a bee dusted with yellow pollen?), and when the bee flies off to another flower, taking the pollen on

its back, those grains will be rubbed against the green pistil there, and will cling to it, because both grains and pistil-tip are sticky!

Now what happens? Something very strange indeed, something you could not see or guess yourself. Look at the picture opposite. No. 1 is a picture of the inside of a pistil. Do you see the fat part at the bottom and the long neck above, ending in the pistil-tip? At the tip is a pollen-grain. A bee brought it to the pistil from another flower a few days ago.

The pollen-grain knew that it had come to the right place. It began to put out a little white tube, and this made its way all down the neck of the pistil. Can you see it? It went right to the lower part where the ovules waited. Do you see the ovules? They look like seeds, and they *will* be seeds later on when each one has been reached by a pollen-tube. They are not seeds yet. They are only little half-seeds. They never will be seeds unless they are reached by a pollen-tube, because the pollen brings them what they need to become a whole seed.

The pollen-tube in the picture has travelled down to an ovule, and it has grown into it, right into the very middle. There was a little hole in the ovule's two coats left ready for the pollen-tube to enter, and it easily found its way. Now it is joined to the ovule, and the little half-seed will soon be whole. It has got what it wanted, and now it can grow marvellously, can develop into a healthy seed, and in time go on a journey to find a new home, where it may grow into a vigorous new plant all by itself.



THE PARTS OF A FLOWER

1. The inside of a pistil showing how the pollen-tube travels to an ovule.
2. Many pollen-grains putting out tubes to ovules. The two tiny ovules have no pollen-tubes and so have not grown.
3. A snapdragon flower. The bee alights on the lower part and its weight opens the “bunny-mouth.”
4. The inside of a foxglove. Do you see the barricade of hairs at the entrance?

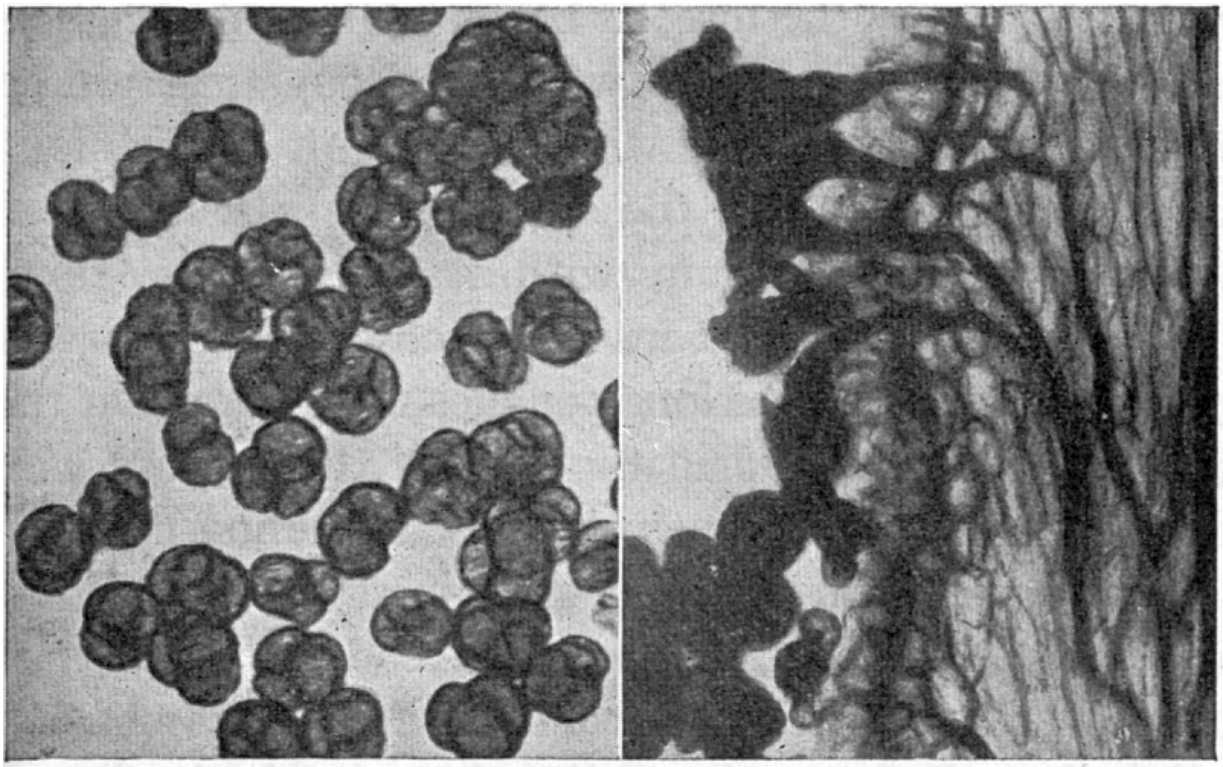
All the little half-seeds in the ovary may be reached by pollen-tubes, and all may grow into whole seeds. The ovary is soon so full that it has to grow too! It swells and becomes larger. When the seeds are ripe it dries up and bursts, and the seeds are freed.

You have all shelled peas, I expect. But how many of you have seen the flowers that came before those long pods? How many have seen the young pea-pods, so small, so thin? You all know *sweet*-pea flowers, don’t you? Well, pea-flowers are the same shape but smaller. When the petals fell off, the pistil was left—a tiny pod. It grew and grew, and the seeds inside became fat and round. Before they were ripe their pod was picked, and

perhaps *you* shelled the peas inside. Did you notice that at one end there were very small peas—perhaps one or two—that had never grown? They did not become pea-seeds—they remained little ovules, little half-seeds. Why? Who knows? Yes—because no pollen-tube reached them! Therefore they could not undergo the magic changes that made them into big fat seeds. They had to remain small and useless.

The pollen-grain and the ovule are partners. A pollen-grain by itself, or an ovule by itself, can never make a seed.

It is better for a plant to have pollen from *another* flower's stamens for its seed-making, than from its own stamens. If a plant uses its own stamens' pollen for its pistil the seeds will not be so healthy or so hardy as they would be if pollen from another plant were used. That is where the bees, butterflies and other insects come in—they take pollen from one flower to another, and so make sure that the seeds are the best that can be got! They do not know they are doing this, of course! No, they go to seek the honey that the flower provides to tempt them, or even to eat some of the pollen itself.



Left: WHAT POLLEN-POWDER LOOKS LIKE UNDER A MICROSCOPE. *Right*: A WONDERFUL PICTURE OF POLLEN-GRAINS SENDING THEIR TUBES DOWN THE STIGMA OF A FLOWER TO THE OVULES

An insect crawls into the flower for honey and becomes covered with pollen. Then it crawls into the next flower and the sticky pistil there takes some of the pollen from the insect's back. All sorts of insects help the flowers. Those with open cups are visited by many kinds. Those with closed cups or with long honey-tubes (think of the snapdragon with its closed cup, or the nasturtium with its long honey-tube) attract more intelligent insects, such as the bee or the butterfly, which have long tongues to probe down the nasturtium spur, and in the case of the bee are wise enough to be able to open the closed "bunny-mouth" of the snapdragon to get at the honey inside.

Indeed, some of the bees are cleverer than they should be, and instead of opening the "bunny-mouth" of the snapdragon and crawling down inside the flower, past the stamens and pistil to reach the honey, they bite a hole at the bottom of the flower where the honey is kept, and so reach it by a short cut! When they do this it means that they do not brush against the pollen or the pistil, and so seeds are not made by that flower—unless it can use some of its own pollen, which it does not really want to do.

When the plant is going to use the wind to blow pollen on to its pistil, it does not bother about lovely petals, sweet scent or delicious honey. It produces simple flowers, plain and not easily seen.

But it is a different matter when living insects have to be used. Then flowers must have colour, brightness, scent or nectar—and the more particular they are about the kind of insect they want for visitor, the more complicated the flower becomes! Think of a simple wild-rose flower, with its open cup spread wide for any visiting insect. Then think of a snapdragon with its complicated "bunny-mouth," or a white dead-nettle flower, a sweet-pea flower, or the long throat of a foxglove made specially for the big humble-bee. The foxglove has even grown a barricade of hairs at its entrance to stop tiny insects from crawling in! It prefers humble-bees, and means to get them. It does get them too, as you will soon find out if you watch a foxglove plant.

Now you know exactly how a seed is made. Use your eyes as you go about, and see how many different shapes of stamens and pistils you can find. You will be quite surprised at the discoveries you make!

THINGS TO DO

1. Draw an open pea-pod from memory. Put in it some fat, ripening seeds, and one or two ovules that have never grown. Write down underneath why these ovules have not become seeds.
2. Look at the stamens and pistils of as many flowers as you can this summer. Draw some of them on your Nature-chart.
3. Try to find out whether plants grow in any other way than from seeds. (Bulbs, corms, runners, etc.)
4. Watch snapdragons, foxgloves, and nasturtiums this summer to see the bees in them. Watch a butterfly closely. Try to see it uncoiling its long tongue to put into the heart of a flower. Look at the first picture in this book.
5. Look at the green flowers of the stinging-nettle. Would you think that the wind or insects took the pollen from stamens to pistil?

CHAPTER 3
THE SUN AND ITS WORK

We have learnt about the work of the wind in another book. Now we will see what work the sun does, and we shall be surprised to find how very important it is—so important that none of us would be alive if the sun were not shining!

It is difficult to look at the sun, isn't it? We can see it better in the early morning and evening. It is not so bright then; it is like a round red ball. As it rises high in the sky it loses its redness and becomes the bright golden sun we cannot look at for long.

What is the sun? Even if I tell you, you will not be able to imagine what it really is, because it is so strange, so mighty, so magnificent. It is big—far bigger than our big earth, a million times bigger. It is a great ball of fire, a fire so hot that even rocks would melt at its touch. It is very far away from us—ninety-three million miles away. We cannot any of us imagine such a distance—but we can think how very, very hot the sun must be to warm us even when it is so far away!

The sun is so fiery that rocks, and metals such as iron, would not even remain in it as liquids—they would be heated until they were turned into gases. *We* can melt iron in our big furnaces so that it runs like water. Rocks are melted in the heat of volcanoes and run down the mountain-sides—but the metals and rocks in the sun are just gases. If they were allowed to cool they would become first liquid metals and rocks, and then the solid metals and rocks we know. But however much I tell you of the heat of that enormous ball, the sun, you will never be able to realise it—why, even the "flames" around the sun are thousands of miles long!

It is no wonder that, with such an enormous fire in the sky, we are well warmed and well lighted! The sun is our lamp and our fire, and it is our clock as well. We set our clocks and watches by the sun.

Each morning he appears over the eastern horizon, climbs the sky in an arch, and sinks again in the western sky, over the edge of the world. We know that the sun does not *really* climb the sky, don't we?—it is really our

world that is turning round from west to east, making it seem as if the sun is travelling from east to west! When we are enjoying the sunshine other children are sleeping in darkness on the other side of our round world. When they get up and go to school in the sunlight we are going to bed in the twilight. How strange it seems!

The sun warms the earth with its rays, and in the summer time sometimes warms it so much that we are far too hot! In very hot countries the people dare not go out in the noonday sun. They lie and rest. Is the sun hotter in the morning or at noon in our country? At noon, of course, when its rays fall straight down instead of slanting! In the morning and in the evening the sun's rays are long and yellow, and the shadows are very, very long. At noon the rays are dazzling bright and shadows are short. Have you ever tried the Shadow Game?

You go out into the playground and make a mark. Stand on the mark and get someone to draw carefully all round your shadow with a piece of chalk. Now go two hours later and stand on the same mark. Get your shadow drawn again. It will be smaller and in a different place! Try two hours later still, and your shadow will be very short and small. Then two hours more, and you will find that it has grown, until when evening comes it is as long as it was in the morning—but opposite where it was drawn then! It is fun to try this game. It will show you very clearly how the sun alters shadows.

We often say to one another, "Oh, the sun is shining now. We can go out to play." Wasn't it shining before then? Yes, it was—but we could not see it. It was behind the clouds that had crept across it. We could not see it or feel its warmth. It was as if someone had put a fire-screen in front of the fire, blocking out its heat and light. But, all the same, the fire was there, as we could see if we peeped round the screen.

A DAY OF GLORIOUS SUNSHINE AT A KENTISH FARM

And if we could peep round the clouds we should see the sun there, shining brightly in the sky. If we had an aeroplane we could fly through the blanketing clouds, and on the other side we should come into dazzling sunshine. If we looked back on the clouds we should feel dazzled too—for the whiteness of them would reflect back the brightness of the sun, just as snow reflects it.

Have you seen the sun go behind a cloud in the evening time? Did you notice the gold edge to the cloud? That is made by the sunshine on the other side of the cloud. Have you seen the silver edge of a big cloud that passes across the sun in the daytime? That is made in the same way. You have all heard of the “silver lining,” haven’t you? Look out for a gold-edged cloud and put down on your Nature chart when you see one.

A great deal of the sun’s warmth and light is reflected back from the earth and lost in space. It is the heat that is taken in by the earth that warms us so much—for when the earth is thoroughly warm it heats the air about it, and that makes us feel deliciously warm. A man in a balloon may feel very cold, although he is floating in full sunshine—for the sunshine around him does not warm the air—it simply passes through it. But we, down on the

ground, may feel terribly hot, because the sun has warmed the earth, which in its turn is warming the air we breathe and move in—and although we are only receiving just the same sunshine as the man in the balloon, we feel ten times hotter!

The ground acts as a sort of radiator for us. Most of you have radiators in your schools, haven't you, or you have perhaps seen them in church. They warm the air around them, and so make *us* warm. And that is what the hot ground does for us too—like our school radiators, it warms our air, and we say, "Oh, what a hot day!"

THE SUN SINKS IN THE WESTERN SKY, LIGHTING UP THE HIGHEST CLOUDS AS IT GOES

If there are clouds in the sky, the warmth of the earth cannot get away, for the clouds act as a kind of blanket and keep the warmth in. But if the sky is clear, especially in the evening, the warmth radiates rapidly away, and we say, "How chilly the evening is!" It is not only because the sun is gone that we are chilly, but also because our great big radiator, the ground, is sending its heat up into the clear sky and losing its warmth rapidly.

Did you know that the sun gave us our moonlight as well as our sunlight?

The moon has no light of its own. It is a world like ours, of hard rock and metals—but it has no living thing on it, so far as we know. It is not a great big fire, as the sun is. What happens is that the sun shines on it and lights up the moon so very brightly that when the moon reflects the sunlight it seems to shine with a light of its own! Moonlight is simply reflected sunlight! Isn't that strange? If there were no sunlight there would be no moonlight.

Indeed, when the sun does not shine on the side of the moon turned towards us, we do not see the moon at night. The next night we see a little bit of the moon, a tiny curve—then a bigger curve, then half the moon, then three-quarters and then the full moon—in fact, just as much of the "face" of the moon as the sun is shining on. When the moon is full, how bright it is! How it lights up the earth! What a strange, cold light it gives, so unlike the sun's warm, dazzling radiance. And yet it is a light borrowed from the sun itself and reflected back to us.

When the sun shines on *us*, our earth looks to the moon just as the moon looks to the earth, only much, much bigger. Isn't it curious to think that we shine on the moon and light up its dark places at night with "earth-light"!

The sun does a great deal of work for us. It is not only a lamp and a fire to us, but it helps to bring the rain. It draws up the moisture from the ponds and rivers, seas and puddles, and makes them into clouds. Then from the clouds comes the rain that freshens the flowers and makes the seeds grow.

The sun gives colour to everything. Think of a day when thick clouds hang over us—how dull and grey everything looks; but as soon as the sun comes out, see how the flowers light up, the green leaves shine and the fruit reddens.

The sun dries up the roads for us, melts the ice on the wintry ponds, penetrates into damp ditches and meadows, and makes them dry for the summer-time. It does smaller things for us, too—it dries the clothes on the line (with the wind's help), and it makes the damp grass dry enough for us to picnic on. What else does the sun do? Yes, it helps the farmer in his hay-making, and it ripens the fruit on our trees; it is our good friend in a hundred and one ways.

THINGS TO DO

1. Play the Shadow Game you have just heard about.
2. Draw something the sun does, and write underneath what the sun is doing in your picture.
3. Write down what is meant by the “silver lining.”

CHAPTER 4
THE SWALLOWS AND THE SWIFT

All of you are sure to have seen the swallows and the swifts this year, darting through the air on their swift wings, their forked tails plainly showing. They come back to us in April, ready to nest in their home-country where they were born, and we are glad to see them, because we know that when they arrive summer cannot be very far away!

We have three different kinds of swallows—did you know? There are the barn swallows, the house martins and the sand martins, all of which belong to the swallow family. Do you know one from the other? I have not forgotten the swift—but as he does not belong to the swallow family I will leave him until later.

I should like each one of you to know the barn swallow by sight. Will you try to recognise him? Have you a coloured picture that will help you? This is what he is like—he has a bright, steel-blue back, a chestnut forehead and throat, a blue bar across his chest, buff under-parts, and a very long forked tail. He flies swiftly through the air on his long, pointed wings, and his song is a sweet, musical twitter—feetafeetit, feetafeet, feetafeetit!

Perhaps most of you know the barn swallow quite well. But can you tell the house martin swallow when you see it? Nine people out of ten will tell you that the house martin is the barn swallow, but you must be the tenth, and say, “That is a *house martin*!”

This is how you can tell the house martin from the swallow—his tail is shorter, the lower part of his back is white, and he has no chestnut on his throat. If you watch him as he flies you will soon see the white patch on his back. Look at it in the picture on page 35. Do you see his shorter tail?

You are not so likely to know the little sand martin, for he prefers the quarries, the railway embankments and the sand-pits to our houses or sheds, and so we do not see him around us so much as the other two swallows. He is the smallest of them and has no blue back, so you can easily pick him out from the others. His colour is mouse-brown with white under-parts, and he has a brown band across his chest. His tail is not much forked and is much

shorter than the swallow's. I wonder if you will be able to pick him out from the other swallows when you see him. You will have to read these descriptions two or three times before you can picture them in your head—and if only you have a large coloured picture of all these birds to see, whilst the descriptions are read, you will soon be able to know by sight all the swallows we have!

Now I must tell you about the swift. Do you know him? Look at the picture. What long, sickle-shaped wings he has! Look at his tail. Is it as forked as the barn swallow's? No, but it is certainly sharply forked. In colour he is sooty-black all over, except for a small white patch under the chin, difficult to see when the bird is any distance away.

If you see a swift in flight you are sure to say what a good name he has—for he certainly *is* swift! He tears through the air at express speed, and he often screams and screeches as he goes, making a noise quite unlike the pretty twittering of the swallows. He may sometimes startle you in the evening, for then he loves to race round the street corners on his long wings, uttering screams of joy and excitement!

It is strange that he is so like the swallows, isn't it? and yet belongs to quite a different family. But, you see, he lives the same aerial life as they do, and so he has grown like them. Birds that live on insects which they catch whilst on the wing need long, pointed wings for speed, a streamer-like tail, and a small beak with a wide gape for catching insects. They do not need strong feet for walking, hopping, running or perching—and therefore the feet of all the four birds you have heard of are weakly, and indeed, in the case of the swift, almost useless. The swift's feet are no more than hooks! There is no backward-pointing toe as other birds have, but all the toes point forward, so that the swift has great difficulty in balancing itself when on the ground.

Top to bottom: THE SAND MARTIN. THE BARN SWALLOW. THE SWIFT. THE HOUSE MARTIN.

However, it has no need to use its feet, for all the day long it is on the wing, quite tireless. It is marvellous to watch it in flight; it wheels here and there, it darts to the side to take a flying insect, it soars upward, it shoots forward, it races by so fast that we hardly see it go! It is master of the air, and some people say that it even sleeps on the wing! But for a few hours each night it hangs itself up by its hook-like feet and rests its wings in sleep —then at the earliest glimmer of dawn it is off again, strong and tireless, screaming with joy and delight.

I know a great many people who have nests of mud under the eaves of their houses, and they say to me that the swallows nest there year after year —but it is the house martins who nest there, not the barn swallows! That is why they are called *house* martins, because they love to nest on our houses. The barn swallows like to nest in barns and out-buildings. They seldom come to our houses to nest. The sand martins, as their name tells you, like a sandy place for nesting—an old sand-pit or a quarry. The swift will sometimes nest under the eaves of a cottage, but he prefers a lofty house or building, such as a church-tower.

Most of you know what the swallows and the house martins use in the building of their nests. What is it? Yes—mud! The barn swallow chooses, perhaps, a beam in a barn, and on it he builds a saucer of mud, lined with feathers and soft grasses. If he places it against a wall he then makes it in the shape of a half-saucer, but these often fall, for they are not so securely built as the nests of the clever little house martin.

The house martin loves our houses. He likes to be near us, he likes to fly over our gardens. He builds his nest as close to us as he can, right under the eaves. His nest, too, is built of mud, and he lines it well with grasses and feathers. The nests are so well built that he can use the same one year after year, simply patching it up afresh each spring-time.

The sand martin burrows into a sandy bank. He may burrow two or three feet or more, and at the end he widens the tunnel and places straw and feathers there for his nest. He always makes the tunnel slope slightly upwards, so that if any rain trickles down through the bank, it will run out of the tunnel, not into his nest (see picture on page 39).

The mud for the swallow’s nest and the house martin’s is taken from brook-sides, pond-sides, or puddles in the road. The birds fly down, collect some in their beaks and fly off to their nesting-place. They press the mud against the beam or against the house wall and then fly off for more. If you

see some small birds very busy pecking about a puddle in the road, look carefully at them. They will probably be swallows or house martins collecting mud for their nests.

How is the swift to build his nest, for his feet are useless to him, so that he cannot fly down to the ground to collect nest materials! He does not mind—he collects all he wants as he flies! He sees a straw blowing in the air and he catches it deftly in his beak. He spies a feather blowing about. He catches that! He takes cobwebs too, and uses those, sticking all these frail, delicate things together to make a flimsy nest in which to bring up his children. The swift has one brood a year, unlike the swallows, who have two or three. The eggs are long in shape and dead-white.

The barn swallow's eggs are white with brown or grey spots. The house martin's are long in shape and pure white, and the sand martin's are also white, and rather thin-shelled.

The three swallows and the swift leave us in the autumn; indeed, the swift may leave us in August. They go to warmer lands, and often fly great distances. And yet, in some marvellous way, when they return to us in April they find their way back to the very village in which they themselves were born. Here they build their nests, or patch up their old ones, lay their eggs, bring up their young, and then once more, when the chilly evenings come, fly off in hundreds to lands where insects are plentiful during our winter. You may see them gathering together in crowds on the telegraph wires or on the roofs of buildings, ready to migrate in a great army.

All the swallows and the swifts do us a great service in the spring-time, for they eat countless numbers of flies, beetles and moths. Any insect that flies is their prey, and when they have their young ones to feed they must catch thousands of insects each day. So we will welcome them joyfully, and hail them as our good friends when we see them flying in the air once more.

I expect you have heard it said that when the swallows fly low, rain or bad weather may be looked for. Do you know why that is? Well, insects fly high in dry weather, for the air is light and dry, but when the atmosphere is heavy with moisture they fly lower down. As they are the food of the swallows, the birds fly low after them—and thus it came about that people said, "The swallows are flying low, so rain is near!" Watch to see if this saying is true.

THINGS TO DO

1. Write these four things down to help you to remember the differences between the three swallows and the swift:

A. The swallow has a steely-blue back, a chestnut breast, and a very long, forked tail.
B. The house martin has no chestnut breast, not such a long tail, but he has a white patch on the lower part of his back by which we may know him.
C. The sand martin is mouse-brown with white under-parts.
D. The swift is sooty-black all over, and his wings are strikingly sickle-shaped. He often makes a screeching noise.

[*Eric Hosking.*

A SAND MARTIN AT THE ENTRANCE TO HIS NEST

2. How does the barn swallow or the house martin build a nest?
3. Draw dozens of little swallows gathering together to fly away in the autumn.
4. Watch to see if the rain comes when the swallows fly low.
5. Watch the birds that skim about through the air or over the surface of the river or pond, and see if you can tell what kind they are—swallow, martin or swift.

CHAPTER 5
THE KEEPING OF CATERPILLARS

Most of us keep caterpillars either at home or at school, and we love to watch the interesting little creatures feeding greedily on the food-plant, or changing their skins, or preparing to turn into chrysalids.

In this lesson I am going to tell you various ways of keeping them, and you will be able to choose which sort of breeding-cage you will have for *your* caterpillars this year. I shall tell you their life-history very shortly, and give you a few important hints on how to rear your caterpillars successfully.

A caterpillar starts life as an egg, usually on the under-side of some leaf. It is one of a large batch of eggs laid by a butterfly or moth. If we could look at these eggs under a microscope or magnifying-glass we should be surprised to see their pretty shape, and the lovely sculptured designs on the surface.

When the right time comes the eggs hatch out into tiny grubs. These usually eat their egg-cases and then start to feast on the leaves of the food-plant, whatever it is. Our caterpillar feeds greedily, until he becomes so fat that his skin looks too tight for him. It actually *is* too tight, and he splits it. Out he steps with a completely new suit underneath, and begins eating once again. It does not matter how fat he gets, his skin will split time and again for him. He becomes very big and fat, and then one day he stops eating and seems ill-at-ease and restless. He knows it is time to change into a chrysalis. He finds a convenient spot, changes his skin for the last time, and either hangs himself up or buries himself in the ground, turning slowly into a hard-shelled chrysalis. If he is going to become a moth, not a butterfly, he weaves himself a silken cocoon. Then he sleeps for some time, and whilst he sleeps a magical change comes over him—he changes into a winged butterfly or moth. He awakes, splits his case and crawls out into the open air—a feeble, limp-winged moth or butterfly. He climbs up a stem, hangs there to allow his wings to dry, and then, when they are wide-spread and beautiful, flies off happily into the sunshine.

Such is the history of any of the little caterpillars we may find now—a marvellous story, and one we may watch for ourselves.

Country schools may have as many as two or three dozen different sorts of caterpillars, for the hedges and fields are near by, and all boys and girls like to hunt for caterpillars. For collecting them take a tin box with you, with tiny holes punched in the lid, and a layer of moss so that when you carry the grubs home they will be protected by the softness of the moss.

Bring back with you a stem and leaves of the plant on which you found your caterpillar—unless it is something you can easily get at home, such as nettles or dock. Do not forget to do this, or to notice very carefully what your caterpillar was on, for it may die if you do not give it the right food. If you are lucky enough to find batches of eggs on a leaf, try to get the whole plant up so that you may plant it in a pot, and thus provide the caterpillars, when they hatch, with plenty of suitable fresh food.

Town schools may buy, very cheaply, the eggs or caterpillars of most of the common butterflies or moths; or a friendly country school will often be willing to send them on request.

Here are some hints about keeping caterpillars:—

1. They must have plenty of air, light and space. Do not keep a lot in one box or they will become diseased and die.

2. Give them fresh food every morning, unless their food is actually growing in a pot.

3. Clean their cage each day without fail.

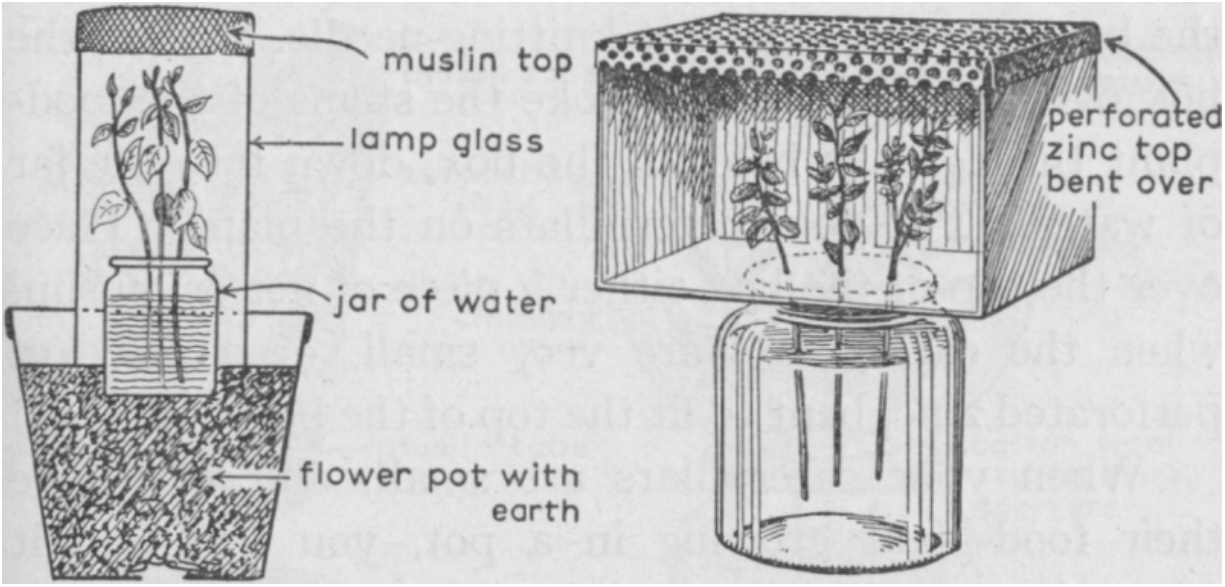
4. At week-ends the most reliable children may take them home to care for.

5. When you think the caterpillars are going to pupate, *i.e.* turn into chrysalids, provide them with soil mixed with sand at the bottom of the cage, and a few dried leaves and small twigs, as many of them like to use these in pupating, and will crawl miserably round the cage and die if they cannot find what they need. If you know what kind your caterpillar is, look up your reference book, and it will probably tell you how your caterpillar pupates. A goat-moth caterpillar, for instance, likes soil, bits of twig, leaves and so on. A cabbage white, on the other hand, climbs up the rough side of the box or up a twig, and hangs itself there, suspended by a silken thread.

6. Do not disturb your caterpillars when they are pupating. When transferring caterpillars from one place to another use a small paint-brush, in case you squeeze the creature’s body too hard.

7. When you know that your chrysalids are about to turn into moths or butterflies, be sure to provide a few upright twigs in their cage so that they may crawl up them in order to hang there and dry their wings. If you do not do this, the poor creatures will crawl round the floor of the cage in misery and will probably cripple themselves.

8. When your caterpillars pupate, keep the chrysalids out-of-doors in a shed or somewhere fairly cool and airy. They dislike being kept indoors. Even if you have to keep them through the winter, you may still keep them out-of-doors. Frost will not hurt them.



Left: FIG. 1.—A GOOD BREEDING-CAGE FOR CATERPILLARS, EASY TO MAKE. *Right*: FIG. 2.—HOW TO USE YOUR EMPTY CHALK-BOXES FOR CAGES (the side of the box is removed in the picture to show the construction of the cage)

There are all sorts of ways to keep your caterpillars. One of the easiest is that suggested by the Board of Education. I will quote what they say:

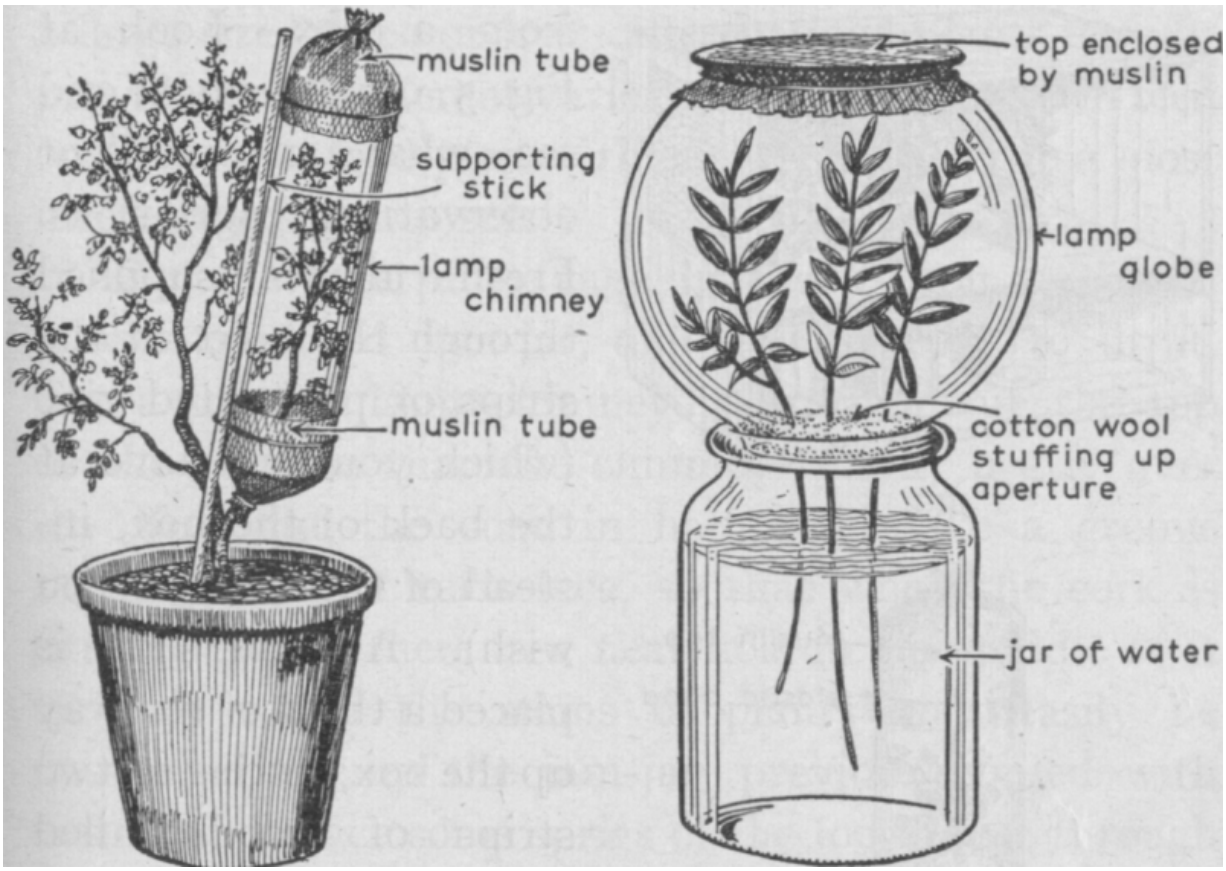
"A few inches of soil are placed in an ordinary flower-pot, and a small bottle filled with water is partially embedded in the soil, and shoots of the plant with the growing caterpillars are placed in the bottle. A wide lampglass with a muslin top rests on the soil and encloses the bottle and its contents. From time to time fresh food is introduced, and after the caterpillars have settled on this the remains of the old food are removed. All stages in the life-history can be readily followed." (See Fig. 1.)

Your empty chalk-boxes will come in quite useful for breeding-cages. Take off the lid. Bore holes in the bottom with a red-hot knitting-needle.

Stand the box over a jar of water. Poke the stems of the food-plant through the holes in the box, down into the jar of water. Put your caterpillars on the plant. Place over the top of the box either a piece of net or muslin, when the caterpillars are very small, or a piece of perforated zinc, bent to fit the top of the box. (Fig. 2.)

When your caterpillars are small, and you have their food-plant growing in a pot, you will find it convenient to “sleeve” a branch of it, moving the apparatus to another branch when the caterpillars have eaten the leaves of the first. The picture (Fig. 3) will show you how to do it.

You will want a lamp-chimney and some muslin. Sew up two pieces of the muslin so that you make two tubes. Slip one tube over each end of the lamp-chimney. Now place the chimney carefully over the branch of the food-plant. Tie the muslin end to the plant stalk. Put in your caterpillars, if they are not already on the leaves, tie up the top of the other muslin tube, and there you have your “cage” of caterpillars, easy to see, and with plenty of light and air. You can slip elastic bands round the chimney to hold the muslin in place, or you may glue the muslin on to the chimney. Put a stick into the pot, and tie the lamp-chimney to it to keep it upright.



Left: FIG. 3.—HOW TO "SLEEVE" A BRANCH OF A PLANT TO MAKE A GOOD BREEDING-CAGE. *Right*: FIG. 4.—THIS IS AN EASILY-MADE AND EFFECTIVE CAGE

When you have the food-plant in water, not growing in a pot, you will want different "cages." Fig. 4 shows a jar of water on the top of which rests a wide lamp-globe. The food-plant sticks down into the water, but be careful to stuff up the opening of the globe (at the bottom) where the stalks pass through, with cotton wool, or your caterpillars will fall through and be drowned. Cover the top with muslin, which you can easily secure round the edge of the globe with an elastic band.

A second cage, bigger than the other, can be made from a box. Look at Fig. 5, on this page, and see what an excellent observation cage it is. Fresh air is supplied through the holes in the strips of perforated zinc (which you can have at the back of the box, instead of the sides, if you wish). A little shelf is placed a third of the way up the box, resting on two strips of wood nailed along the sides. Holes are bored in this shelf to allow the stalks of plants to poke through. On the underneath are pots of water. The leafy part of the food-plants is on the top shelf, as you see, and the stalks go through the holes and stand in the water below. The caterpillars feed on the leaves

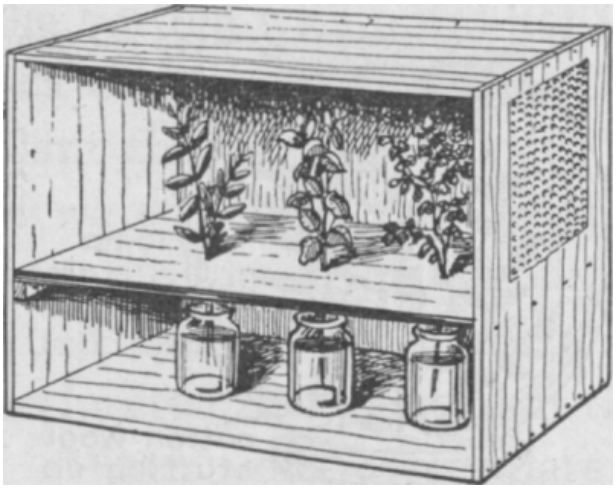


FIG. 5.

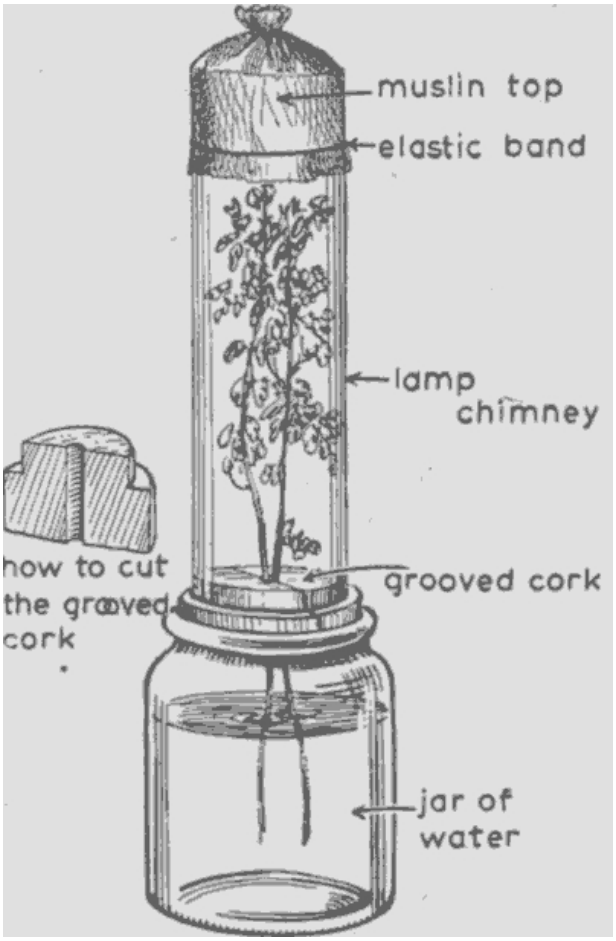


FIG. 6.

on the top shelf. A sheet of glass is cut for the front of the cage. If the cage is of a large size, three or four different food-plants may be provided, and different varieties of caterpillars will feed on their own food-plants, thus making the cage a most interesting sight to see.

For the caterpillar cage in Fig. 6 you will need a wide-mouthed jam-jar, and a thick cork to fit it. Get a narrow lamp-chimney, and then cut the top of the cork so that the chimney will fit neatly over it. Now cut the cork in half and make a groove in the centre of each face, so that when the cork is fitted together there is a neat hole in the middle of it through which the stems of plants may easily be passed. Cork up the jam-jar, previously filled with water, and place some sprigs of the food-plant through the hole in the cork, so that they stand in the water. If any space is left between cork and stalks, stuff up with cotton wool.

Now slip on the lamp-chimney, fitting it over the top of the cork. Slip a tube of muslin over the top of the chimney, using an elastic band to hold the top together. Now you can see your caterpillars eating, and can be sure that their food is fresh and sweet.

THINGS TO DO

1. Write the story of a butterfly, from egg to perfect insect.
2. Draw pictures to go with the story.
3. Make one or more of the breeding-cages described and keep your caterpillars in it.

CHAPTER 6
FLOWERS FOR YOU TO FIND

There are at least 20 or 30 common flowers you ought to know by sight this term, not counting the very commonest, such as Daisy or Buttercup, which surely every child knows. I am going to tell you, very shortly, where to find these flowers and what they are like. You must look them up in your Flower Book (I hope you have all got one with coloured pictures in), and examine them well. Then off you must go hunting, and how proud those schools will be who can set up the whole array and name them!

I am going to suppose that you all know the following flowers: Hawthorn (May), Daisy, Buttercup, Dandelion, Gorse, Poppy, Thistle, White and Red Clover, Bluebell and Stinging Nettle. That is, we start off with 11 flowers we know already. But you must find them, please, and give them their names. Now we will hunt for those you may not know so well. I have put them in alphabetical order.

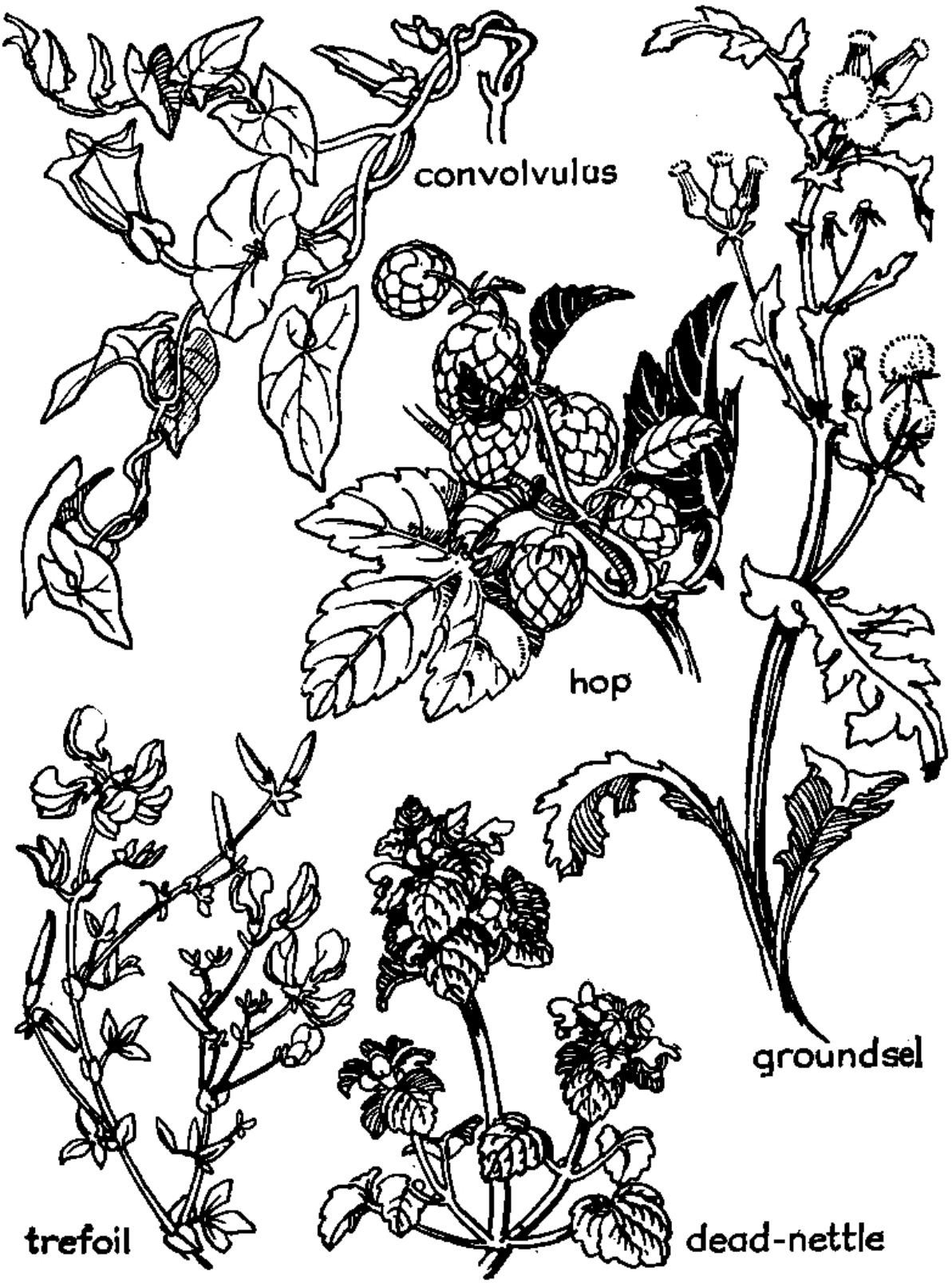
12. Blue Bugle. Look on banks and in fields. The deep blue flowers grow closely together from the top to the bottom of the stem. Look at the stem. It is pale purple and is four-sided.
13. Bramble Flower. You all know the Blackberry bushes, don't you? Look for the early Bramble flowers on the bushes in late June. They may be white or pink.
14. Birdsfoot Trefoil. This grows in fields, woods and waste places, and the golden-yellow flowers have orange streaks in them. The flowers are sweet-pea shaped, and grow in tufts at the end of the long flower-stalk. Trefoil means three-leaved, but if you count the leaflets on each short stalk you will find there are five. The name Birdsfoot comes from the seed-pods, which, when they are ripe and hang down, look like the bunched-up claws of a bird. You perhaps know this flower by the pretty name of Shoes and Stockings.
15. Common Agrimony. Look for this plant in dry places, such as hedge-banks or by field-paths. It has bright yellow flowers growing in long, tapering

spikes. The lowest flowers come out first, their clusters of five petals looking like small stars.

16. Cow Parsnip. This hedgeside and meadow flower belongs to what we call the Umbrella Family! At the end of the stem the flowers are borne on stiff, umbrella-like spokes, and if you imagine the stem to be the handle of the umbrella you will see that the spokes at the end look rather like an umbrella that has blown inside out. There are a good many plants belonging to this family, and you will always be able to recognise them by their "umbrellas." The Cow Parsnip has a flat mass of small white flowers held by the umbrella spokes. It is a tall plant, as big as you, with a stout, hollow stem, in which little insects hide in winter.

17. Dead Nettle. (White.) Many people muddle this flower with the Stinging Nettle, but you may easily tell the difference by looking for its pretty white flowers. The Stinging Nettle has green flowers and dark green leaves. The leaves of the Dead Nettle are paler. They grow in pairs up the stem, and the pretty white, tube-shaped flowers grow in circles round the stem, beside the leaves.

18. Dove's Foot Crane's Bill. This small pink flower can be found easily by the wayside all the summer through. It has geranium-like leaves, which are soft and downy. Look for the curious beak-like seed-vessels, sticking boldly upwards when the flowers die. These give the plant its curious name of Crane's Bill. The stem is weak and lies near the ground. *Herb-Robert* is a common cousin of Dove's Foot Crane's Bill, and you may tell it by its stronger stalk and lovely red leaves, very much cut up.



SOME COMMON FLOWERS YOU SHOULD KNOW

19. Field Convolvulus. (*Bindweed.*) Look for this little flower in fields, waste places and banks. It has pale pink or white flowers shaped like a pretty wide-open bell. The leaves are arrow-shaped. Look at the stalk—it twists itself round other plants, and often strangles them.
20. Fumitory. You will find Common Fumitory in waste places and fields. It is a dainty-looking plant with finely-cut, delicate, grey-green leaves and pretty rose-pink flowers. These are in clusters, and each little flower puts out what looks like a small pink tongue.
21. Groundsel. If you have a canary I expect you know this plant, for canaries love to peck at the little seeds. The small yellow flowers look like little shaving-brushes, crowded together in clusters. The leaves are dark green and glossy, shaped like feathers. Look for Groundsel in any waste place. It flowers all the year round.
22. Ground Ivy. In hedges, waste ground and by the wayside you will find this very common little plant, with its purple-blue tube-like flowers and kidney-shaped leaves growing at intervals all the way up the stalk. I cannot tell you why it has such a strange name, unless it is because it rather likes to trail about, like ivy.
23. Goose Grass. (*Cleavers.*) You do not need to see the flowers to recognise this clinging plant with its square stem set with hooks that catch hold of other plants. Its long, narrow leaves also have hooks growing on them, and these catch hold of our stockings as we pass. The flowers are small and white.
24. Hemlock. This is a poisonous plant, and you should know it so that you can avoid it. It belongs to the Umbrella family, like the Cow Parsnip, and you will see a family likeness between them. There are the same clusters of white flowers at the end of the umbrella spokes, but beneath each cluster of flowers you will see three little pointed leaves, all turning to the same side. Now look at the stem, which is spotted with purple-pink and is perfectly smooth, not hairy. It is a tall plant, with finely-divided, fern-like leaves. You will find it by the wayside, by the hedge and in open woods.
25. Hop Trefoil. Look for this dainty little plant at field edges and in meadows. It has small round yellow heads just like a tiny clover, and its leaflets are in threes, like a well-spaced shamrock leaf.
26. Jack-by-the-Hedge. (*Sauce-Alone* or *Garlic Mustard.*) A plant about two feet high with delicate green, heart-shaped leaves, and small, very white

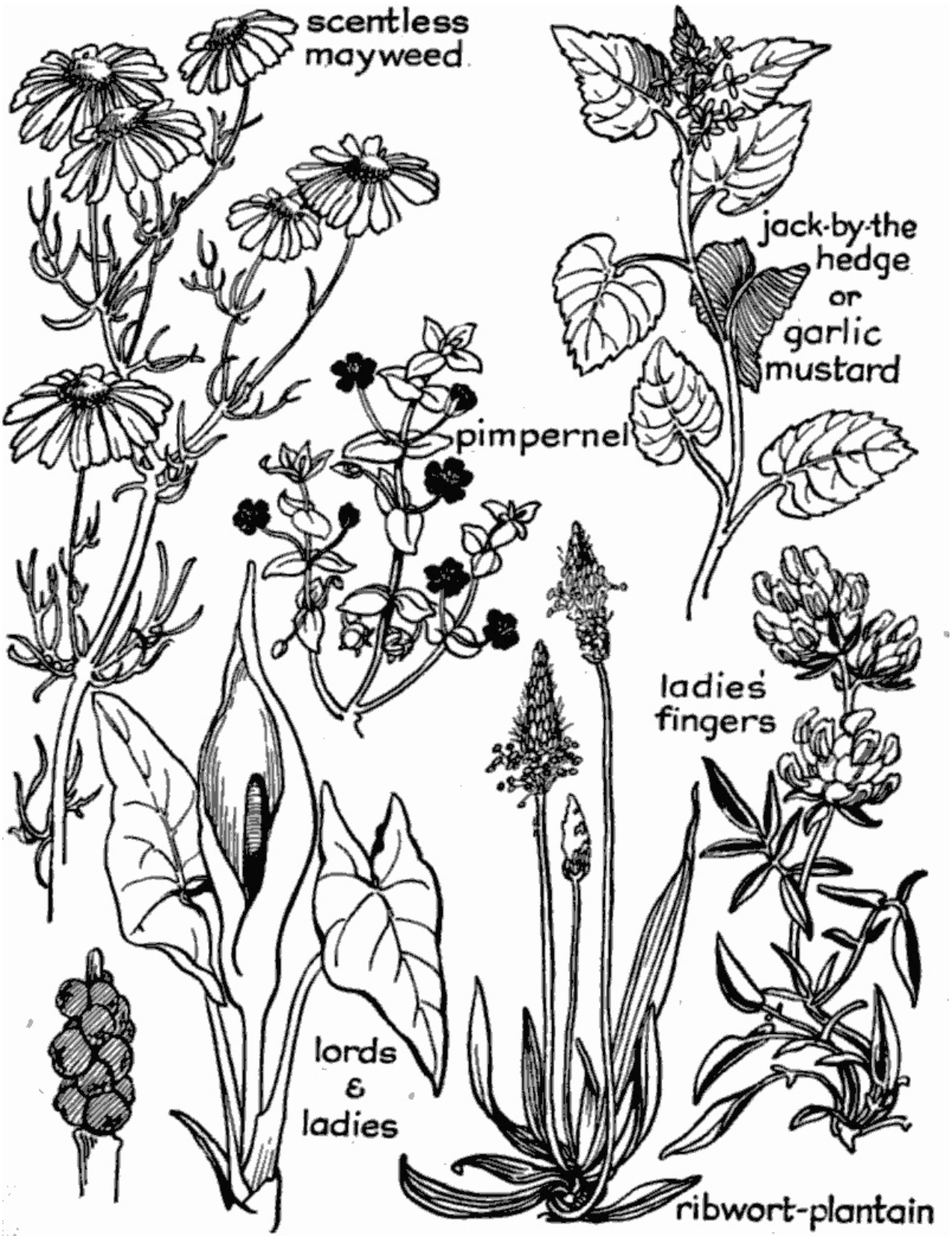
flowers. When picked it smells like garlic, and is most unpleasant. It is found in the hedges.

27. Lady's Fingers. You are sure to find these showy yellow flowers growing in fields and on warm banks. In shape the flowers are rather like the Birdsfoot Trefoil, and are grouped together, twenty or thirty at a time, at the end of a sturdy stalk. The yellow flowers have rather a woolly appearance owing to the down on the sepals.

28. Lords and Ladies. (*Cuckoo-pint, Wake-Robin*.) You are certain to know this strange plant with its great sheath of green, enclosing a club-shaped red or purple tongue. It grows in the hedges.

29. Mayweed (Scentless.) This is a very common daisy flower, not so big as the Ox-Eye Daisy, or so stiff, but bushier. Look at the yellow centres of these daisy-like flowers and see if you can find some that look very queer. Do you see how the white strap-petals droop down when the flower is over, and how the yellow centre has arched itself up like a yellow thimble? It is very quaint-looking. The green leaves are finely divided, almost hairlike. You will find the Mayweed in fields and by the wayside.

30. Ox-Eye Daisy. This big field daisy is too well known to need many words. It is a sturdy, handsome plant with feather-shaped leaves, and is often found mingled with the buttercups.



COMMON FLOWERS YOU WILL FIND IN THE FIELDS AND HEDGES

31. Pansy. (*Heartsease.*) The wild pansy is just like a tiny garden pansy, usually yellow in colour, tinged with purple. You will generally find it growing in cultivated fields.
32. Pimpernel. This is one of our few red flowers. It is brilliant scarlet, the small flowers growing on little stalks that spring out from where each pair of leaves grows. You will find it growing in waste places, by the wayside and in cultivated fields.
33. Red Campion. This is a pretty plant with a liking for damp places, such as the hedgeside. Its rose-coloured flowers have five petals, cleft halfway down as if someone had taken a bite out of them! If you look inside the flowers you will see that they will either have stamens but no pistil, or pistil but no stamens. The Red Campion has an untidy cousin, *Ragged Robin*. If you see a plant with rose-pink petals that look as if they have been slashed into rags, you will know it is Ragged Robin.
34. Ribwort Plantain. Perhaps you have played at "Cocks and Hens" or "Soldiers" with this plant? You pick the brown, cone-shaped flower-heads by their long, ribbed stalks, and first one of you and then the other tries to strike off the head of the flower with your own flower. When the Plantain is in flower it is very pretty, for the whole brown head is full of showy yellow stamens. The leaves, narrow and pointed, dark green on one side and grey-green on the other, are ribbed all the way up. That is how the plant gets its name. You will find it easily in the fields and meadows.
35. Shepherd's Purse. You will probably know the Shepherd's Purse, not by its tiny white flowers at the top of its stalk, but by the heart-shaped little "purses" growing all the way up the stem, the seed-boxes of the flower. There are two kinds of leaves, one kind forming a rosette on the ground, the other kind arrow-head shaped, growing up the stem.
36. Speedwell. Along the hedge-banks you will find a small bright blue flower, which perhaps you know by the name of Bird's Eye. The petals are four in number, and in the midst of each is a tiny white circle, like a minute eye. The flowers grow in tapering clusters, often very near the ground, for the Germander Speedwell has a habit of creeping before it grows upwards.
37. Sorrel. The dull crimson spikes of the Common Sorrel can be found almost anywhere, but perhaps they are prettiest to see when mixed with the golden buttercups and white ox-eye daisies. They stand up above the daisies, tall spires of tiny, dull-red flowers. The leaves are arrow-shaped.

38. Tormentil. You may often have seen this dainty yellow flower growing on banks and in woods. It has four pale yellow petals, which it opens wide, and its leaves are cut into five fine fingers.
39. Vetches and Vetchlings. You are sure to find many plants with purple or yellow sweet-pea shaped flowers, climbing upwards by means of tendrils. There are all kinds. One of the prettiest is the Tufted Vetch, which has its narrow, silky leaflets in about ten pairs. It strews its spikes of bluish-purple flowers all over the hedges as it climbs.

I have no more space to describe to you further flowers you should know—but the 39 above will be quite enough for you to find this summer. For those who already know most of them, here is a short list of further flowers to hunt for:—Wild Clematis (Travellers' Joy or Old Man's Beard), Black Bryony and White Bryony, Purple Loosestrife, Wood Spurge, Yarrow, Beaked Parsley, Broom, Foxglove, Mullein, Corn-Cockle, Marigold, Mallow, Rest Harrow, Wild Carrot, Toadflax, Meadow-Sweet and Wild Hop.

CHAPTER 7
THE STORY OF THE BEE

I really need a whole book to tell you the story of the bee; it is such a wonderful tale, and there is so much to say. I will just tell you what I can, and hope that you will be interested enough to find out more for yourself later on.

The bee has a marvellous body. It has two pairs of wings, and these are neatly fastened together by rows of tiny hooks when the bee flies. Its tongue is wonderfully made so that it may take the nectar from the flowers. Have you ever watched a bee thrusting its tongue into a flower? Its body is covered with hairs that brush the pollen from the stamens, and on its hind-legs are pollen baskets or pockets, fringed with stiff hairs that comb the pollen from the bee's body into the pockets.

You know that bees help the flowers to make their fruits, don't you? A flower cannot make good seed until it has pollen from another flower brought to it—and this the bees do. Plants that are grown in greenhouses into which bees cannot find their way have to ask *us* for help. My greenhouse tomatoes, for instance, must have *my* help in brushing pollen from one flower to another, or they will not grow their ripe red fruit for me. But the outdoor tomatoes are pollinated by the busy bees, and I do not need to take my little paint-brush to them as I do to the indoor ones.

The flowers give the bees pollen and nectar. The nectar is changed to honey by the bees in a very marvellous way. They take both pollen and nectar back to their hives for food for themselves and for the baby bees, and they also store it up for the winter, when no flowers bloom.

From the pollen and honey they make a mixture called Bee-Bread, and on this the young bee-grubs are fed. They are also given a food called Royal Jelly, but they only have this at first. A grub fed entirely on Royal Jelly becomes not a worker-bee but a queen-bee. It is strange that a difference in food means either an ordinary bee or a royal bee, isn't it?

I expect you know what a hive is like from the outside; it is a neat wooden box on legs, and it takes to pieces so that the honey may be easily

removed. Thousands of bees live in the hive, and most of them work hard all day long.

BOYS AND GIRLS LEARNING ABOUT BEE-KEEPING AT THEIR SCHOOL, WHERE A HIVE OF BEES IS KEPT

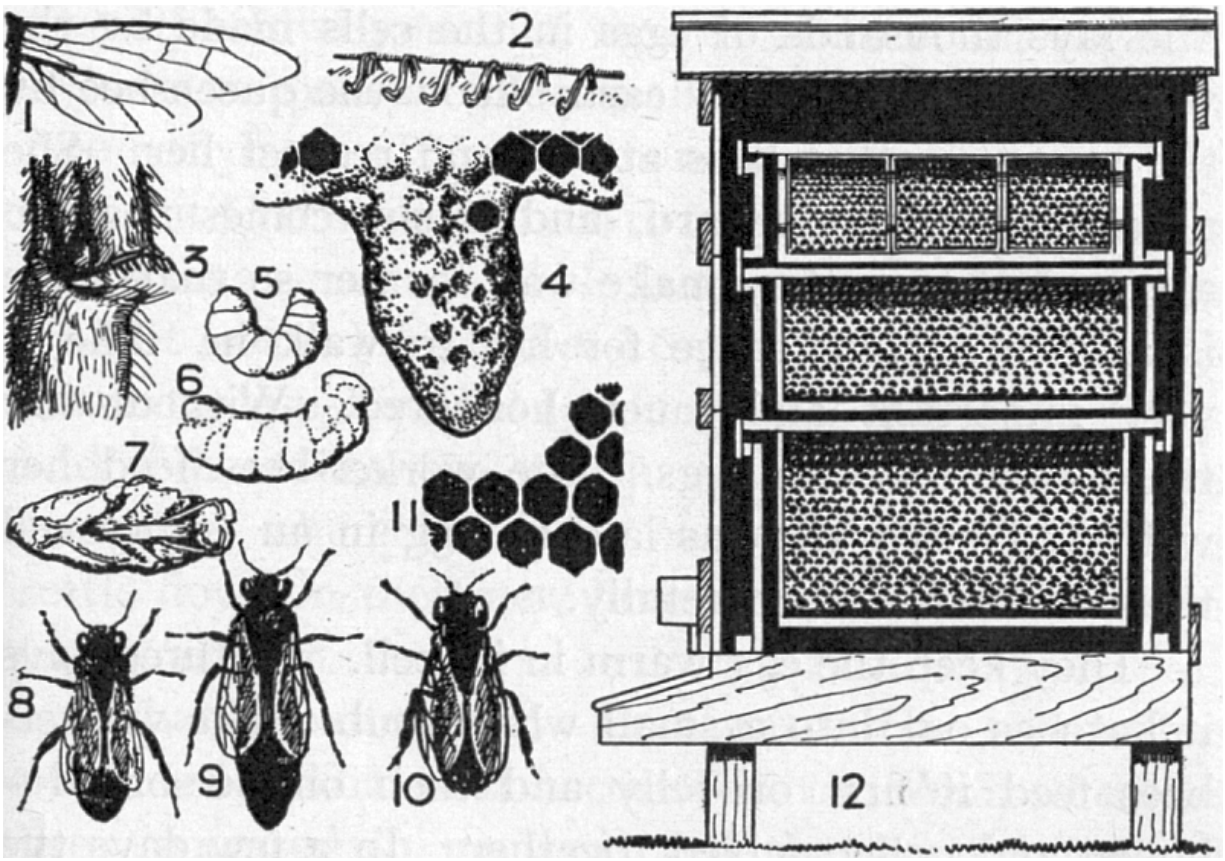
Sometimes people keep bees in the old-fashioned straw skeps. The bees do not mind where they live so long as there is plenty of room to bring up their children and store honey for the winter. Have you a section of

honeycomb to see? That is taken from a hive. Look at it closely. Do you see the cells filled with honey? Doesn't it look delicious? The bees packed it in those cells. Who made the cells? The *wooden* section was certainly made by a human being—but those delicate waxen cells were bee-made. How many sides have they? Count and see. There are six to each cell. A collection of six-sided cells cleverly uses every bit of space available without wasting any. *Round* cells would waste a good deal of space. The cells are made of wax, which the bees make out of their own bodies.

If we could make ourselves very small and creep in at the hive-entrance with the bees, we should stand and gaze in amazement at the busy city inside. There would be bees rushing all over the place. Some would be putting honey into cells. Others would be feeding the small bee-grubs, each in its waxen, six-sided cell. Then we should see some bees standing and whirring their wings, making a draught. Why do they do that? Simply because the hive is too warm, and so some of the bees are given the task of cooling it!

Other bees act as the hive's dustmen. They go about cleaning up the hive and removing anything dirty or unnecessary. The hive must be kept clean as well as cool, for dirt might bring not only discomfort but disease. The hive is like a well-ordered town.

In the hive there are three different kinds of bees. There is the small, ordinary bee we know so well—busy, hard-working, most industrious. There are thousands of these worker bees in the hive. Then there are bigger, fatter drone bees who do nothing. They have not even leg-baskets to put pollen in. They do not go out for nectar, they do not help in any of the work of the hive. They beg the busy worker-bees for food. One of them will some day be the husband of the queen-bee, but otherwise they are useless.



THE BEES AND THE HIVE WHERE THEY LIVE

1. Upper and lower wings of honey-bee. 2. Hooks that hold together the two wings in flight. 3. Pollen pocket in joint of leg. 4. Royal cell. 5. The grub. 6. Grub spinning its cocoon. 7. The pupa. 8. A worker-bee. 9. A queen-bee. 10. A drone-bee. 11. Section of honeycomb. 12. Section of a hive.

The third kind of bee is a big bee, very long in the body—so long that her wings only come halfway down her back. This is the queen-bee. We shall only see one in the hive. She does a most important work. She lays thousands of eggs in the cells made by the worker-bees. You may easily know the queen-bee by the way the other bees attend and respect her. She always has a bodyguard, and if she comes near to a crowd of bees they make way for her so that there is always a clear space for her to walk in. She is very important and much honoured. Without her there would be no eggs. The worker-bees feed her well, and when she has laid an egg in an empty cell they watch over it carefully.

They keep the egg warm in its cell. In three days it hatches out into a small white grub. The worker-bees feed it first on jelly and then on bee-bread—honey and pollen mixed together. In a few days the grub is so big that it takes up all the room in its cell. Then the bees put a lid on the little cell and the grub is a prisoner. It spins itself a thin cocoon and goes to sleep.

While it sleeps it changes from a grub into a bee. In a week's time it eats a hole in its cocoon, opens the lid of its cell and walks out—a soft, wet bee, ready to take its place in the busy hive and work as hard as all the others.

As the summer goes on, the hive gets overcrowded and the queen takes some of the bees away to find a new home. This is when the bees swarm. The air seems suddenly full of a shrill whirring sound—the noise of thousands of bees humming excitedly—and from the hive pour out masses of bees, all eager to follow the queen. She usually flies to a branch of a tree near by, and there she and a great cluster of bees wait until her scouts return to tell her of a good place for a new hive—perhaps a hole in a wall or in a hollow tree.

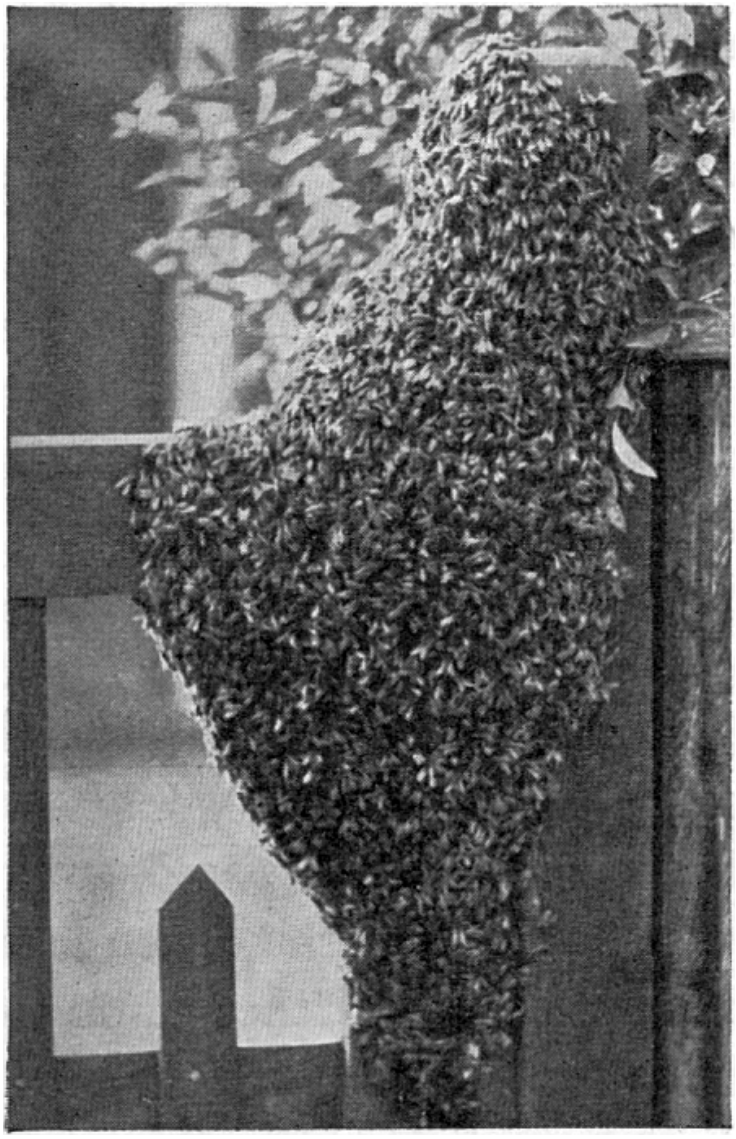
But meanwhile the bee-keeper is busy—he does not mean to lose his bees! He gets a new hive ready, and if he takes the swarm successfully he now has two hives where before he had only one! The bees settle down in their new hive and start their work as busily as ever.

What about the hive that was left? It now has no queen. What will become of it? Well, when the bees increased in number, and the workers guessed that a time would come when the queen would fly away with a party of her own, they prepared some special, big cells for princess-bee eggs. The queen laid eggs in these cells and the workers fed the grubs on special royal jelly. When the queen at last flew off with her party of bees, the workers who were left waited for the first princess-bee to hatch.

As soon as she crawled out of her cell she went to the other royal cells and stung the princesses there to death. There can never be more than one queen in a hive. Then this princess became queen and went on with the business of laying eggs in the hive.

If a queen should die and there are no princess-bees to hatch, the bees take a worker-bee grub and feed it on the royal jelly. They make the cell walls longer, and lo and behold, the worker-bee grub grows into a queen-bee!

The drone-bees have a short life. They do not live through the winter as the other bees do. They have taken no part in the work of fetching and storing honey for the winter, and so, when winter is near, the worker-bees will not let them live to feast on honey that others have gathered in. So they fall upon the startled drones and bite off their wings. Then they cast them out of the hive to perish in the cold autumn. Poor drones—they cannot work if they would. They have an easy life but a short one.



A SWARM OF BEES CLUSTERING ON A GARDEN GATE

The bees store far too much honey for their own use. There is plenty over for us, and we take it and spread it on our bread and butter for tea.

We all like the little honey-bees, but perhaps most of us like best the big, blundering humble- or bumble-bees. They are so big and furry, they seem such jolly, good-natured fellows, humming loudly as they go booming in and out of the flowers. These, too, have a life rather like that of the ordinary bee. The queen makes a nest and lays eggs somewhere in a bank, in a heap of stones, or in a hole in the thatched roof of a house. As soon as the eggs hatch out the young bees start work and help the queen to fetch honey and to build more cells. They are worker-bees. Later on in the season drones and princess-bees are hatched out. The humble-bee does not store honey for the winter—only for the wet, cold days of summer-time. At the end of the season the drones and the workers die. Only the queen-bee and the princesses live on, finding a warm corner somewhere in the ivy or in a hole in a wall; each of them will make a nest the next summer.

THINGS TO DO

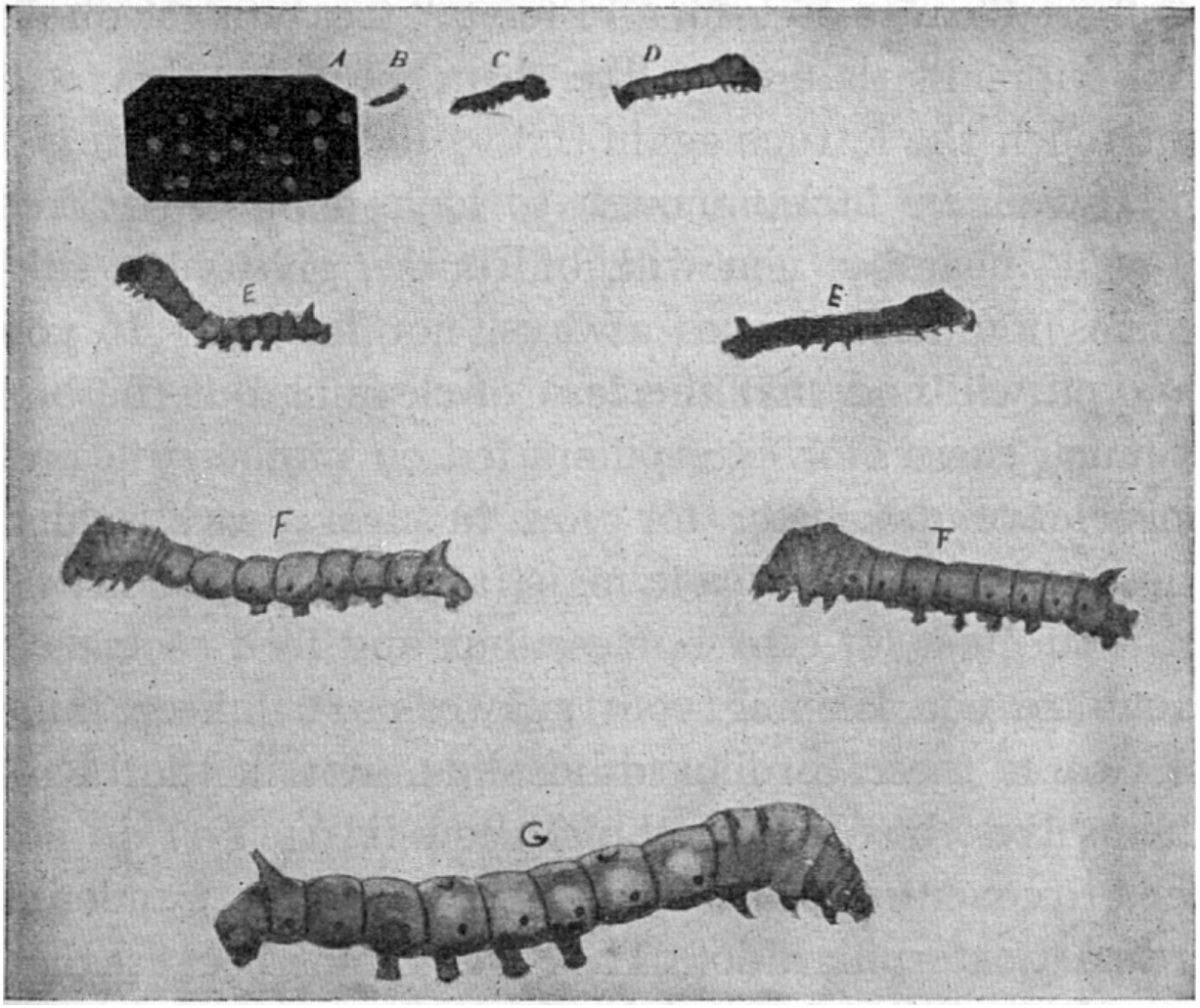
1. Write down the three different kinds of honey-bee and say what each does.
2. Pretend you are a bee in a hive, and say what you see going on around you.
3. Draw a piece of honeycomb, remembering to give each cell six sides.

CHAPTER 8
THE KEEPING OF SILKWORMS

I hope that all of you are keeping silkworms this year. The eggs are very cheap to buy—you can easily get a hundred for a shilling—and it is great fun to watch the caterpillars feeding, growing, changing their skins, and spinning their wonderful cocoons, from which come the silk-moths.

May is the month for hatching-out the eggs, so if you have none you can perhaps buy the young caterpillars to watch. I am going to tell you the best way to keep them, so that you may have healthy, strong silkworms, and fine silken cocoons.

The eggs are the size of a pinhead, round and flattened. The tiny silkworms inside eat their way out of the egg-shell, and when they are hatched they look like short bits of black thread. Sometimes they cannot get rid of the shell, bits of which stick to their bodies and annoy them. In order to help them to get rid of the bits some people place a sheet of drawing-paper over the caterpillars, and in the paper they make tiny holes. On the top of the paper are put fresh leaves. The caterpillars make their way to the leaves through the little holes in the paper, and as they crawl through they scrape off the bits of shell still clinging to them. Then they begin to feed on the leaves.



A SILKWORM'S GROWTH

As you perhaps know, silkworms like the leaves of the mulberry tree better than anything else—but they will feed eagerly on ordinary lettuce, so you will easily be able to supply them with fresh food. Cabbage lettuce is better than cos lettuce. Use the outside leaves, and be sure to wipe them dry before you give them to the caterpillars. Do not give them mulberry leaves occasionally for a "treat"—if you do you will find that they like them so much they will not touch the lettuce again!

If you *are* lucky enough to have a mulberry tree growing near by, you will, of course, give your silkworms mulberry leaves always, not lettuce. If you do, you will find that the task of cleaning out the box is much easier, for caterpillars fed on mulberry leaves only leave dry litter for you to clear away, whilst those fed on lettuce leave moist and unpleasant litter.

You must, of course, clean out and feed each day. How are you keeping your silkworms? I keep mine in two or three cardboard-box lids—not in the boxes themselves, but just in the shallow lids. You do not need to cover your silkworms, for they do not wander as ordinary caterpillars do. They are “tame” because they have been fed and cared for for so many many years. So all you need is a shallow lid, with the sides about an inch or so deep. Keep them in an airy place, but not in a draught. If you put them on an open windowsill, watch that no birds come along to steal them! You will have to cover them with muslin if they do.

You will probably find that your silkworms hatch out at different times, so that you will have caterpillars of different sizes. You can keep the youngest ones in one lid, the next size in another lid and the oldest ones in a third lid. Keep an empty fourth lid to use when cleaning out the other lids. You will find it best to remove the silkworms to the fourth lid when cleaning out their dirty lid.

How are you going to move them? You must be very careful or you will hurt their soft bodies. As soon as you get to school in the morning you must put a fresh leaf or two in the silkworm’s lid, the one they are feeding in. In a short while most of the grubs will have walked on to the new food. Now you can carefully pick up the new leaves and put them in the empty lid, caterpillars and all. If there are a few silkworms still left in the old lid, use a camel-hair brush to move them gently on to a new leaf, and then pick up the leaf and remove it to the other lid. You will find it a good plan to print the number of silkworms on their lid, and count them as you move them, or else you may find you have thrown one or two away with the litter and dead leaves.

Now clean out the old lid, and place fresh food there, returning the silkworms when you are ready. Remember that you must never give them old, dry leaves—always fresh, tender juicy ones. One of you must see to them at the week-ends, of course; somebody careful and trustworthy.

Perhaps when you go to look at your silkworms you may see a few that look as if they feel ill. They will not eat—but we need not be alarmed, they are only going to change their skin! They do this for the first time when they are about a week old. You must watch a silkworm changing its skin if you can. It is really very interesting to watch the skin split and the caterpillar work its way out of it. If you have a magnifying glass you must use it, then you will see everything very easily.

After the silkworm has changed its skin (a brand-new one appears under the old one!) it seems tired and exhausted and takes a rest. Then off it goes in a hurry to feed again and grows very quickly indeed.

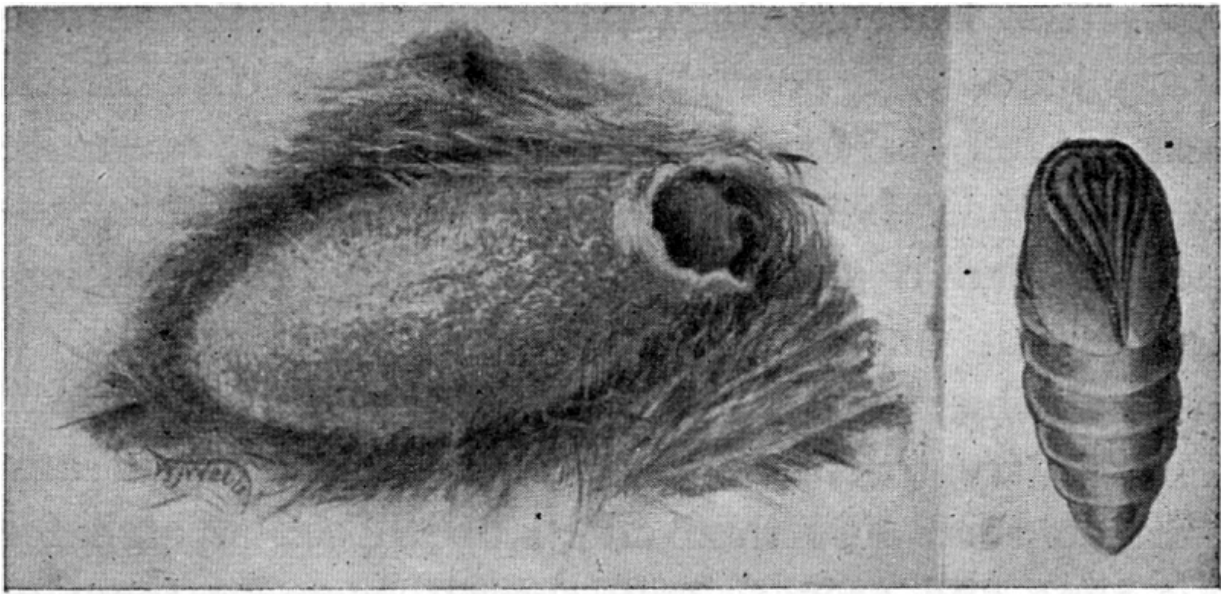
Count how many times your silkworms take off their old skins. They will do it four times as they grow. How they eat! They really do seem greedy, and it is no wonder their skins burst! They soon lose their black colour and change to a pearly grey. They grow to a big size, two or three inches long, and it seems impossible that only a few weeks back they were like tiny bits of black cotton.

Cleaning and feeding becomes quite a business after four or five weeks, and we must never miss a day in our care of them. After six weeks some of the silkworms begin to look different. They seem to have shrunk a little and they look rather transparent. They will not eat and they raise their heads, shaking them and moving them about as if they felt giddy.

The time has come for them to change into a chrysalis. First they were eggs, then they were caterpillars—and now the third stage of their life is near. After the fourth moult the silkworms ate more greedily than ever. They were amazingly hungry—they needed a great deal of food to prepare them for the time when they could not eat any more. Now that time has come.

They try to climb upwards. If we have put any twigs in their box they climb up those. Watch for this time and prepare cone-shaped bags for them of paper—coloured blotting-paper is best. Twist up the paper as you have seen the grocer do, and gently put the silkworm into it. Prepare as many bags as you have silkworms. Write on each bag the date on which you put the caterpillar in. Now pin the bag up on the wall, but first of all place underneath it a sheet of paper, because when the silkworm begins to spin in the bag some water flows from it, and this may mark the classroom wall if we are not careful.

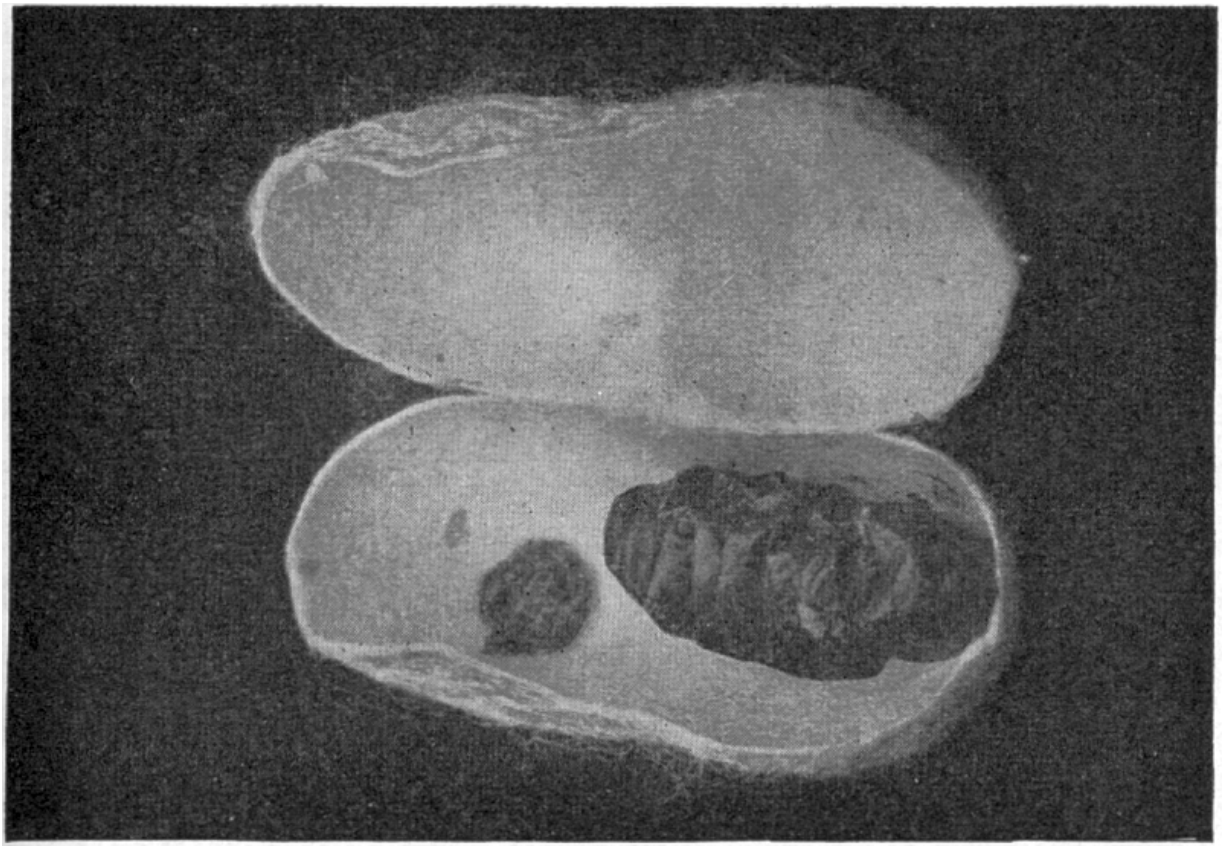
Now the silkworm begins its most interesting work—it spins a cocoon of real silk, fine and fairy-like. We can watch it spinning. Look into the paper-bag and see it moving its head continually to and fro, to and fro. A thin thread of silk is coming from its lower lip. Can you see it? Use a magnifying glass if you have one. First of all, the silkworm fastens itself to the bag—then it begins to make its pretty oval cocoon.



Left: THE COCOON, SHOWING THE HOLE FROM WHICH THE SILKWORM MOTH CAME OUT. *Right*: THE CHRYSALIS

To and fro goes its busy head, winding the silk round itself. At first we can see it quite clearly, then it can just be seen behind a thick veil of silk, and at last we cannot see it at all, for it is hidden in ever-thickening silk. After three or four days the cocoon is finished. There it lies in the bag, a beautiful golden case (or perhaps greenish or white, depending on the kind of silkworms we have—but usually the cocoons are deep gold).

Inside the silken cocoon lies the silkworm. It has changed its skin there for the last time—and this time its new skin is different. It has no mouth, no legs. It is not nearly so long as it was. It is soft, and is yellowish-white. In fact, it is no longer a caterpillar, but a chrysalis. Its skin soon becomes hard, like a shell, and it turns a red-brown colour. It lies still and does not move—but inside that shell great and amazing changes are taking place.



A COCOON CUT IN HALF TO SHOW THE CHRYSALIS INSIDE

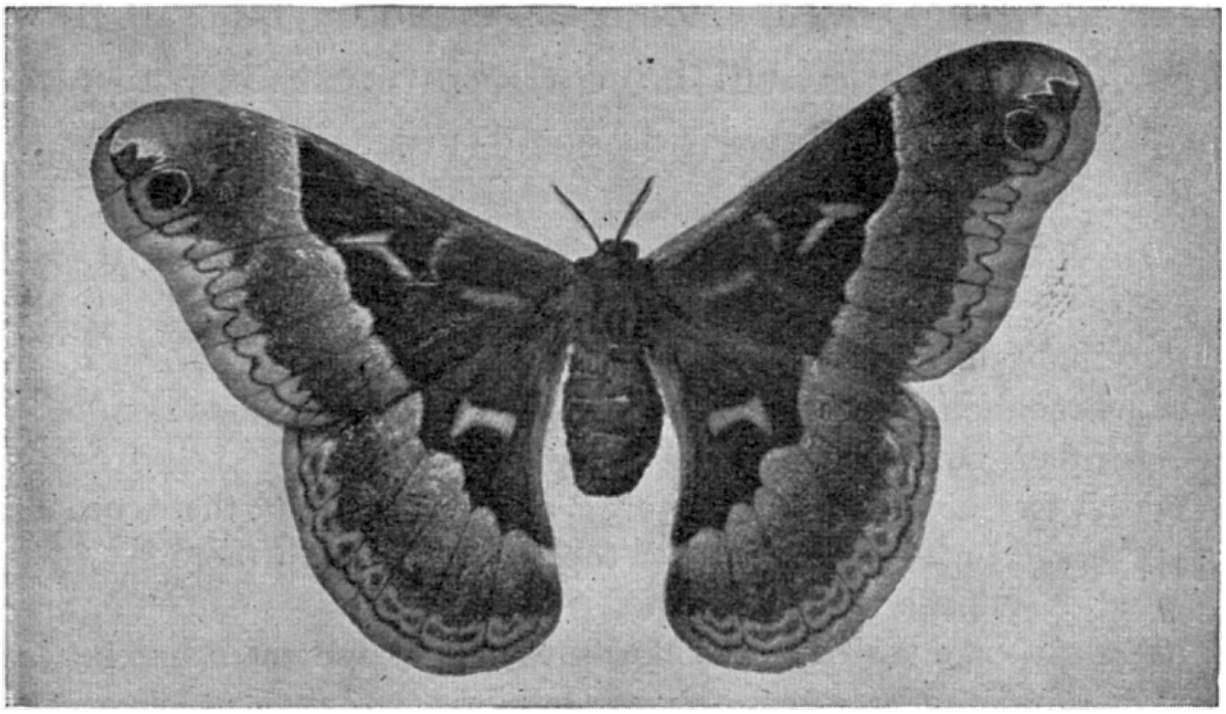
Sometimes, after a silkworm is placed in the bag to make its cocoon, it will not rest there, but tries to get out. In this case it is probably not ready to spin, and should be replaced in the box and allowed to continue eating, if it will.

Do you want to wind off the silk to see what it is like? You must wait for a week. Then take out the yellow cocoon from the bag—isn't it pretty? Pull off the loose outer silk, and find the end of the one long thread that the silkworm used to spin its cocoon. Have you found it? Now take a doubled-over piece of stiff paper, about 3 inches wide, and, taking the end of the silken thread, wind the silk round and round the paper. As you wind it, and the threads lie over one another, you will see how fine yet strong the silk thread is, and what a lovely colour. It will take you a long time to wind off the silk. The cocoon becomes smaller and smaller as you take the silk, and at last there will be nothing left but the little hard-shelled chrysalis, together with the last cast-off skin of the silkworm. The cocoon will be gone—you have wound it all off on your paper! Of this silk are our dresses, stockings

and many other things made. Isn’t it strange to think that so many millions of caterpillars work to give us clothes of pure silk!

Inside the chrysalis a swift and curious transformation is going on. The one-time caterpillar is changing into a moth. At last it is ready to come out from the cocoon. It has no mouth, so it cannot bite its way through the silk —but it has in its head two little glands which contain what is called a solvent liquid—a liquid that flows out and loosens the silken threads of the cocoon, making a hole for the moth to creep from.

The moths are cream-coloured, their wings marked with wavy, faint brown lines. Their bodies are stout and look furry. They stand on their cocoons, drying their wings, and we can tell which are male and which are female by the size. The females are the bigger moths.



A SILKWORM MOTH

Now you must get ready a box and line it with paper. Put the moths in the box, without the lid. They cannot fly and will not wander. They have no mouths, so you do not need to give them any food. Just leave them alone in a shady place.

They will lay their eggs for you—hundreds of them! Then, their work done, they will die peacefully. Take out the lining-paper from the box, cut out the patches of eggs and leave them exposed to the air for a few days.

Then put them away in a cool place until next year, when once more you will have eggs hatching and will have the interest of watching the life-story of silkworms once again.

THINGS TO DO

1. Buy some silkworms if you have none.
2. Draw them once a week on a silkworm chart. Put the dates.
3. Clean their box and feed them every day.
4. Watch to see when your silkworms are ready to spin their cocoons.

Prepare cone-shaped bags for them and put them there.

5. Wind off the silk from a cocoon.
6. Keep the eggs laid by the silkworms, and watch them hatch next year.

CHAPTER 9
SOME TREES YOU SHOULD KNOW

I have told you of some common birds you should know and flowers you should find—now I am going to tell you some trees to look for. It is easy to name them in summer-time because they have their leaves—it is more difficult in winter.

The Hawthorn

A tree you are sure to know, because of the lovely may-blossom it bears. It is very often found in the hedges as a bush. Look at the branches. You will see that they are set with sharp thorns. The leaves are a pretty shape, divided into blunt fingers. They are glossy and dark green in colour. See if you can find the little clusters of green knobs that will turn into the bright red haws so much loved by the birds in the winter.

The Horse-Chestnut

Another well-known tree, easily recognised in May by the beautiful white or pink spires of blossom it bears, making the chestnut look like a giant Christmas tree set with candles! I expect you had the buds in your schoolroom this spring—fat and sticky. The leaves are cut into five or seven pear-shaped fingers, which turn brown, yellow and red in August. What is the fruit of this tree? I am sure that every boy and girl knows the brown, satiny “conkers” in their prickly cases.

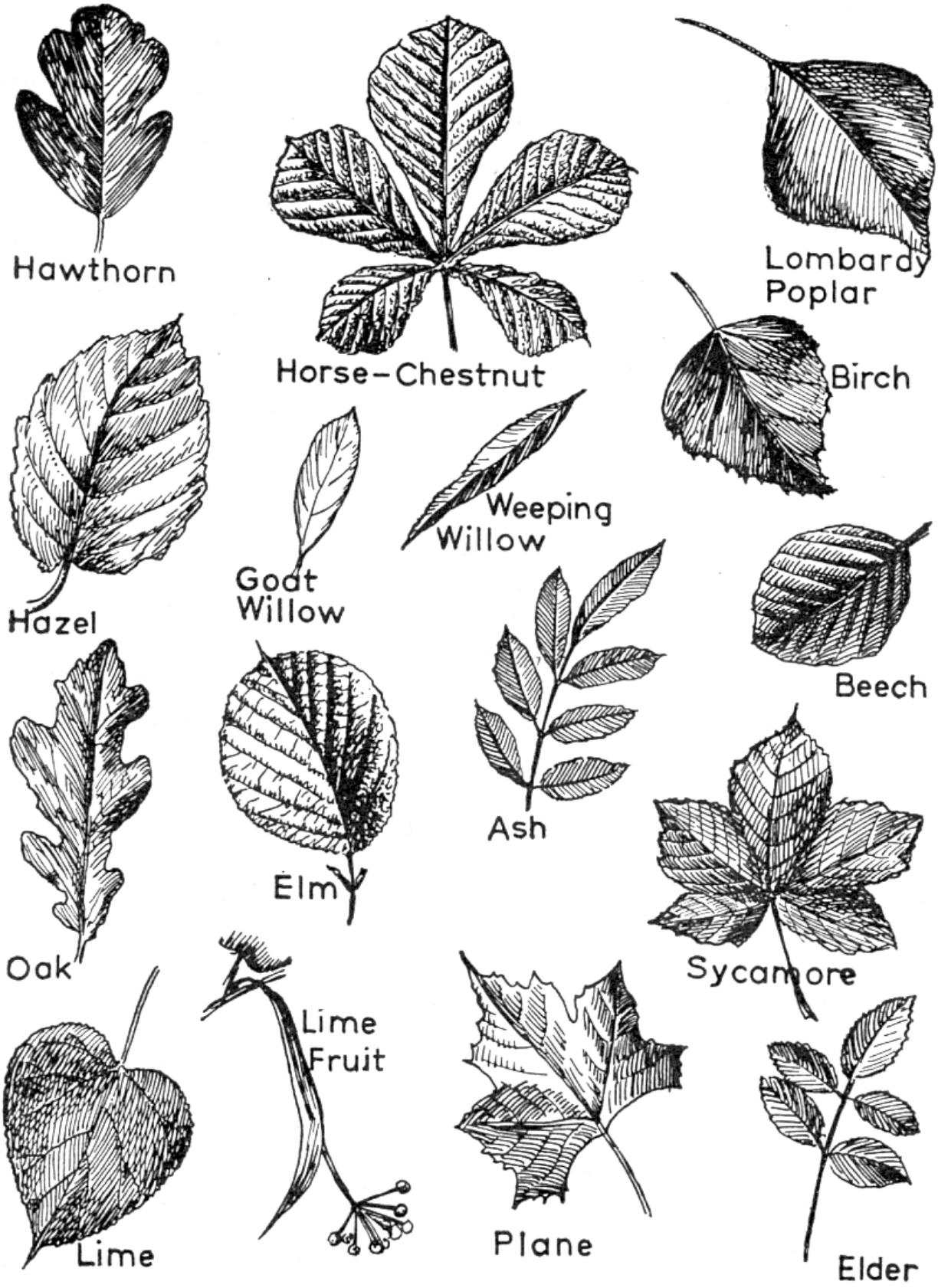
The Lombardy Poplar

This is another tree most of you will know because of its spire-like shape. All its branches are held upright, instead of sideways. You have heard the old story, I expect, of the crock of gold that was given to the tree to hide? It was so anxious to hold it safely that it held its branches upright, close to the trunk, to prevent the crock from falling or from being seen.

The leaves are heart-shaped with a wavy margin, and are dark green. You may not be able to pick any, as they may be too far above your head,

but you will easily be able to see their shape. They turn a beautiful yellow in the autumn.

The black poplar spreads its branches outwards, and has leaves of similar shape.


Hawthorn
Horse-Chestnut
Lombardy Poplar
Birch
Hazel
Goat Willow
Weeping Willow
Beech
Oak
Elm
Ash
Sycamore
Lime
Lime Fruit
Plane
Elder

CAN YOU FIND ALL THESE DIFFERENT LEAVES WHEN NEXT YOU GO FOR A WALK? SEE IF YOU CAN!

The Hazel

Country children will know this tree well, because of the delicious nuts it bears! It looks more like a big bush than a tree, because very often it has no central trunk, but merely a cluster of upright-growing branches. This is the tree that shakes out the yellow “lambs-tail” catkins in the early spring.

The leaves are large, irregularly heart-shaped. They are deep green in the summer and turn to a pretty golden-brown later. Look for the little green nuts, already forming for the autumn.

The Willows

There are too many kinds of willow trees for me to tell you them all. Did you get some palm for Palm Sunday? Well, the tree you cut your palm from was the Goat Willow. Find it again, and look at its pretty oval leaves, dark and shiny above and paler beneath. How different the tree looks now from the time when it stood clothed in golden pussy-catkins!

The Weeping Willow is easy to recognise, because it has graceful, whip-like branches drooping downwards. The leaves are long and narrow.

The White Willow is the largest of the willow family. You may know it by its silvery look, due to the silky surface of its leaves, which are the typical willow shape, long and narrow.

Your cricket bats are made from willow wood. Lobster-pots are made from the pliant withy or willow branches. Have you seen Pollard Willows? They are trees with short, stout trunks growing usually by the stream or canal-side, and they have had their branches so continually lopped that their heads are nothing but a shock of long, slender shoots.

The Silver Birch

You will know this tree by its long thin trunk and its pretty silvery bark. It is a graceful, fairy-like tree, and its silvery trunk gleams like grey satin. The Red Indians use birch bark to cover their canoes, because it is practically indestructible. The leaves are very small, glossy and oval-shaped. Look for the little winged seeds.

The Oak

This is a grand tree, sturdy and strong. Look at its rough, knobbly trunk and branches. See its pretty feather-shaped leaves, so unlike those of other trees. They are dark green and glossy. Can you see any old acorn cups under the tree? Pick them up and see how prettily patterned the cups are. The "oak-apples" you see on the oak are not the fruit of the tree (which is, of course, its acorns), but are due to insects.

The Beech

This is perhaps the most beautiful of our trees. If the oak is King of the woods, the beech is Queen. Look at its trunk and see how tall, straight and smooth it is, and what a lovely green-grey colour. You will easily be able to see the leaves and pick some, for the beech branches sweep almost down to the ground. Do you remember how sharp and pointed the leaf-buds were in the spring? The leaves are oval with a pointed tip and wavy margin. They are thin leaves, smooth, with very straight veins. In the autumn they become such a glorious tawny-brown that we pick them to decorate our classrooms. Look under the beech and see if you can find last year's seed cases.

The Elm

This tree grows to a very great height. You may know it by the large amount of brushwood growing all round its trunk, giving it an uneven, irregular shape, but very pretty. Look at the rough trunk with its deep cracks and grooves. The leaves are small for such a large tree and feel coarse and rough to our fingers.

The Ash

You may tell the ash tree by the colour and straightness of its trunk. It is ashy-grey, as you may guess from its name. Do you remember the coal-black buds it had in the spring-time? Out of those hard black buds have come thousands of pretty, feathery leaves. Look at them closely—you will see that each leaf is cut up into many pairs of graceful leaflets, lance-shaped, and toothed round the edges. All the leaflets sit on one central stalk. Do you know the fruit of the ash? Look for the tufts of "spinners" or "keys" later on.

The Lime

You may often see in towns a row of trees down a street, with their branches cut off so that all they have left is an ugly, knobbly head, from which later on spring new shoots and twigs. These pollarded trees will be limes. When they are allowed to grow into their own shape they are pretty trees, with very dark, rather smooth trunks. The leaves are very bright green, large and heart-shaped, toothed all round the edges. Look for the queer blossoms—little clusters of yellowish-white flowers whose stalks join on to one long stalk that springs from a long green bract. The fruit looks like a bunch of downy balls.

The Sycamore or Great Maple

Do you know the sycamore "keys" that spin round and round in the air in the autumn? They are the winged seeds of this tree. Look at the leaves and you will see that they are large, shaped like a hand, with five blunt fingers sticking out. They are coarse, rough leaves. The trunk is grey and rather rough.

The Plane

You may tell the plane tree by its queer trunk. The bark peels off in big flakes, and the bright under-surface shows up clearly, giving the trunk an odd, patchy appearance. Children in the towns will know this tree very well, for it is a favourite one for town-planting.

Its leaves are rather like those of the sycamore, being hand-shaped with five fingers. If you pull one off with its stalk you will see that the base of the stem neatly covers next year's bud. The fruit you will know very well—it hangs down like a lot of little round balls among the branches.

The Elder

Country children are sure to know this tree, for it is from the elder's stems that they so often make popguns or pea-shooters. The stems are filled with pith, which is easily taken out, leaving a neat, hollow tube. The elder never grows very tall, and in summer time its flat-topped clusters of creamy flowers are very noticeable.

THINGS TO DO

1. Start out with a sheet of paper or a notebook in which you have roughly drawn the leaves of the trees you want to find.
2. Bring back leaves of the trees, together with notes of anything special you have noticed about the trees.
3. Draw and colour the leaves. Put the names underneath.
4. Look up in your reference book the trees whose leaves you find and read what the book says about the tree.
5. When you feel you are really getting to know something about trees, make a Tree-Book for your drawings and notes.

CHAPTER 10
SEASIDE CREATURES

Some of you may be going to the seaside for your holidays, so in this chapter I am going to tell you what to look for on the beach and in the pools. You will find it great fun to hunt for these creatures and look at them closely.

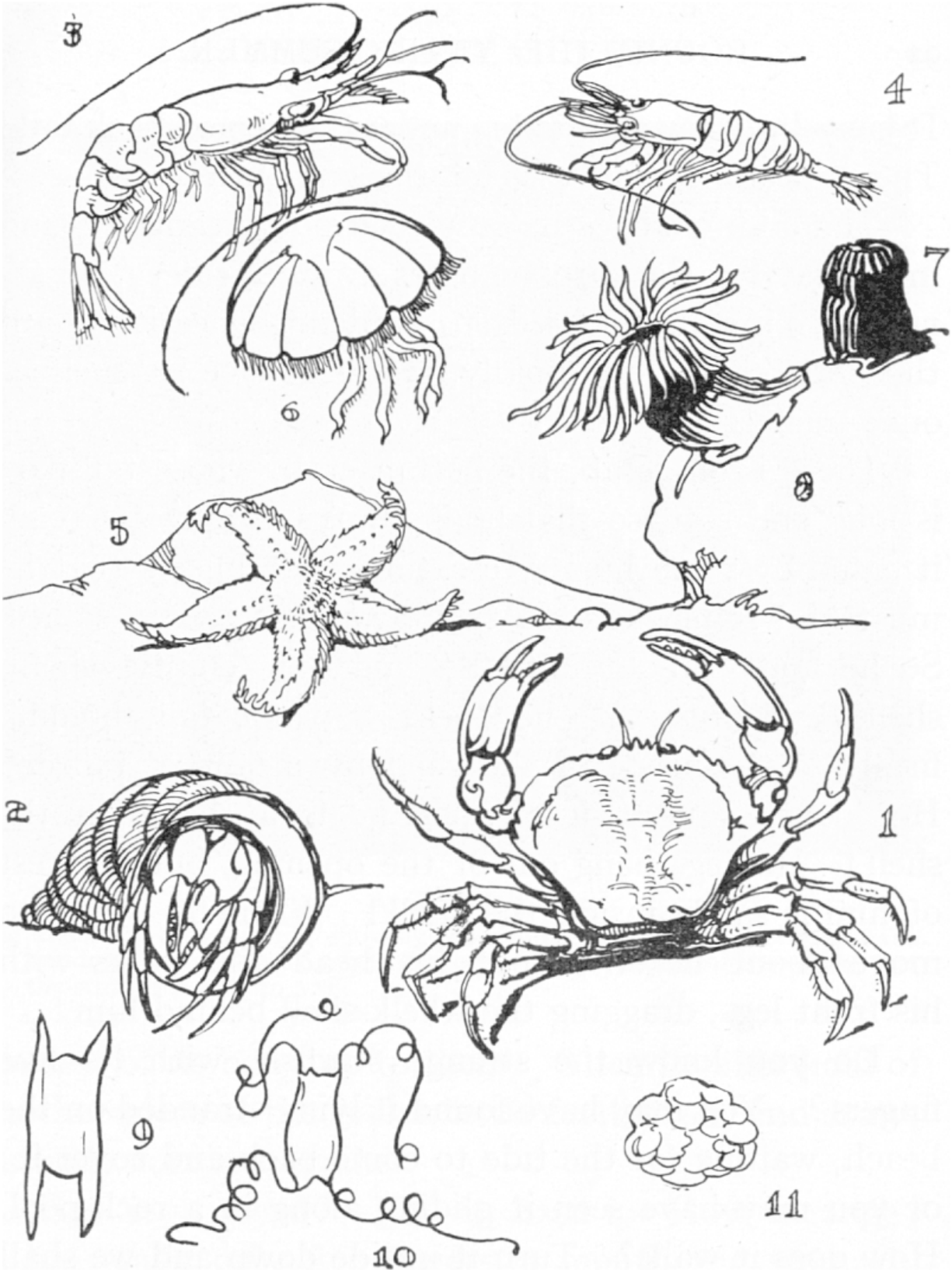
I am sure you will want to go shrimping or prawning. Look into the rock-pools. Do you see those grey-green shadows darting here and there? They are shrimps. Some of you will be surprised that they are not pink like the shrimps in the shops—but those are boiled, and the boiling turns them a different colour. The prawns in the deeper pools look like very big shrimps. Catch some and look at them. If you want to examine them very carefully you can buy a few shrimps or prawns from the fishmonger.

They look as if they were wearing suits of old-fashioned armour, don't they! They have many enemies, and so they must protect themselves. Sometimes their suits of armour get too small for their growing bodies, and then the shrimps and prawns split them and squeeze out of them, showing brand-new suits underneath. These are rather soft, however, so, fearful of being eaten, the creatures hide away until their new armour has become as hard as the old.

Look at their legs. They have two different sets, one for walking and one for swimming! How queer it would be if *we* had two sets of legs, wouldn't it! The swimming legs are near the tail, and are fringed and flattened. The walking legs are near the head, and are long and thin. Look at the creature's eyes. They are set on a short stalk, so that it may see as much as possible. Now feel the spike that juts out from the head. If it is saw-edged, you are holding a prawn. If it is smooth, you have a shrimp. Now you will be able to tell the difference between a small prawn and a big shrimp!

You all know crabs, I am sure. You have seen them scuttle sideways over the sand when frightened, or bury themselves swiftly in the bed of a

rock-pool. Watch them when you can, and if you catch one, turn it upside down and have a look at the queer little creature.



THINGS TO LOOK FOR ON THE SEASHORE

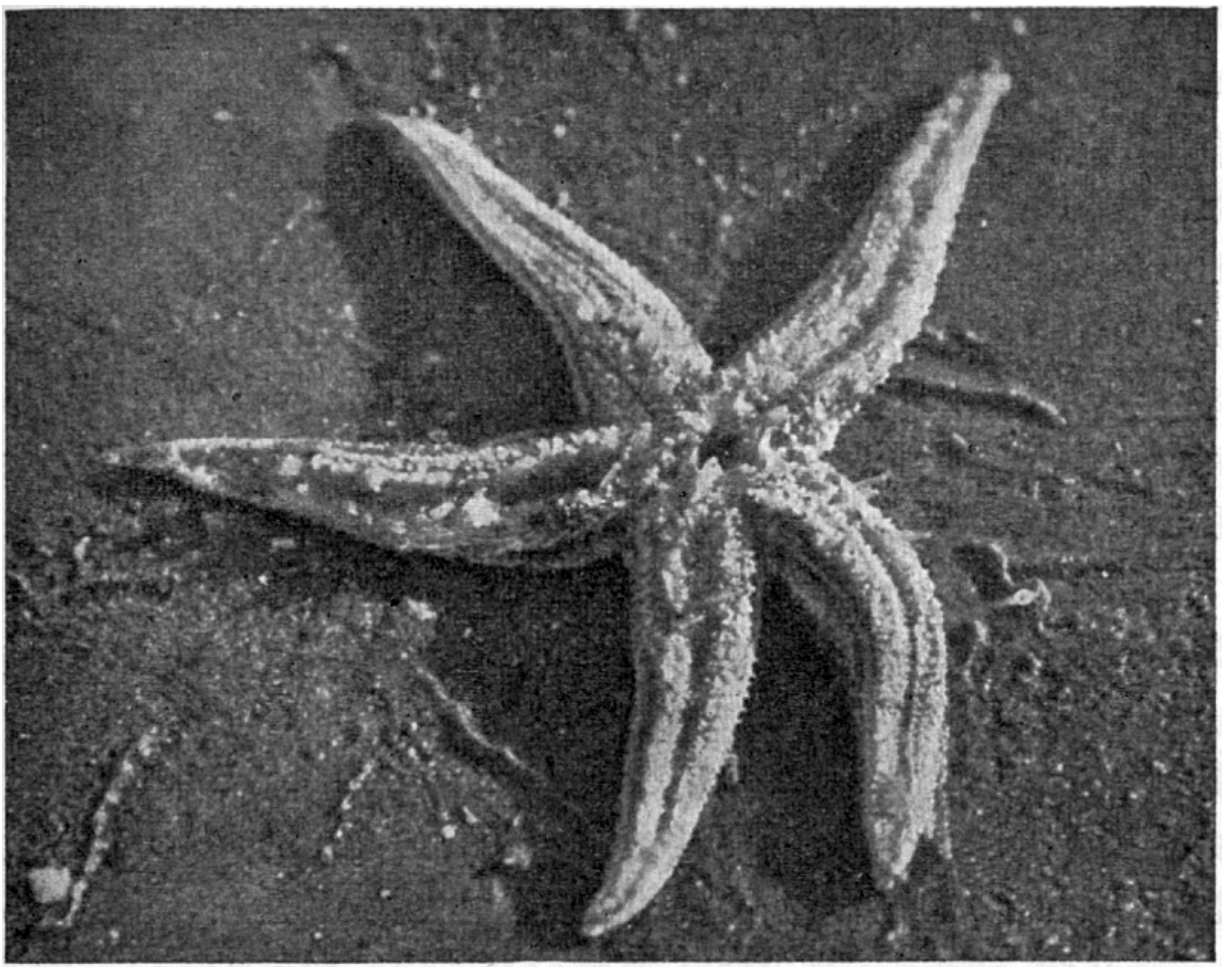
1. The crab. 2. The hermit crab: it has tucked its soft tail in an empty whelk-shell. 3. Prawn. 4. Shrimp. 5. Starfish. 6. Jelly-fish. 7, 8. Anemone, open and closed. 9. Egg-case of skate. 10. Egg-case of dogfish. 11. Egg-case of whelk.

If you buy a crab from a fishmonger's you will easily be able to see its walking legs, its funny, turned-back tail, its broad, armour-like shell, its strong pincers and its queer eyes. Look at it carefully. Count its legs (five pairs). They are strong, well-developed legs, used for walking, for the crab walks far more than it swims. Has it any swimming legs? Look and see. It has—but they are hidden under the turned-back tail! They are almost useless, for the crab rarely swims.

The crab changes its suit of armour regularly, and immediately afterwards it hides away in safety, for its new shell is soft and needs to harden. Once it is hard the crab comes out boldly, ready to face its enemies once more.

There is one crab, the hermit-crab, whose tail-part is long and soft, so that he is always afraid of having it eaten by some hungry creature. He knows that he must find somewhere to tuck away his tail in safety. So he hunts about until he finds an empty whelk-shell, and into this he tucks his soft tail, holding firmly to the inside of the shell by means of pincers. He looks a queer sight when he is at home in the shell! His legs hang out of the opening, but the rest of him is safely inside the shell! When he wants to move about he sticks out his head and walks with his front legs, dragging the whelk-shell behind him!

Do you know the strange starfish, with its five fingers? You may have found it lying stranded on the beach, waiting for the tide to come back and cover it; or you may have seen it gliding along in a rock-pool. How does it walk? Turn it upside down and we shall see. Each of the five rays, or fingers, is grooved underneath and carries four rows of sucker-like feet. It clings to the rock with some of its feet and draws the rest of its body up to them. Then it takes hold of another piece of the rock a little farther on, and draws its body forward again.



A STARFISH

The underside of a starfish, showing the mouth right in the centre and the hundreds of tube-feet on each ray or arm. By means of these tube-feet the starfish is able to walk.

Has it a head? No, it hasn’t. How strange! It has really only five fingers, a mouth and stomach. Its mouth is underneath, in the middle of the rays, and its stomach is just behind it. Run your fingers along the upper surface of the rays. How rough and spiny they are! That is to prevent enemies from making a meal of the starfish. Among the spines are many tiny pairs of pincers, continually snapping to prevent anything from settling on the starfish. They are so tiny that you cannot see them easily with your eye alone.

If a starfish meets with an accident, and loses one or more of its rays, it does not mind. It simply grows new rays—and the ray that is cut off may even grow four more fingers and become a new starfish!

Another strange creature is the queer jelly-fish. Have you ever seen them swimming in the sea, opening and shutting their big jelly-umbrellas as

they go along? Perhaps you have found some lying on the sand. They are shapeless masses of jelly then, not the graceful things they appear in the sea. As they are made up of water and very little else, the hot sun soon melts them, and in a short time nothing is left of the curious creatures but a little round mark on the sand.

They get their food in a queer way. All round the edge of the jelly "umbrella" is a fringe of fine threads, the creature's fishing-lines. These threads are set with poisoned darts, and if any unwary shrimp or other creature swims against them, the darts shoot into the victim's body and poison him swiftly. Then he becomes a fine feast for the jelly-fish.

There is one jelly-fish we must beware of when we bathe in the sea. It is a yellow-brown colour, and its name is the Stinging Jelly-fish. Its threads are so poisonous that they may make us ill if we brush against them. We feel as if we have been stung by a nettle!

In the rock-pools you must look for the sea-anemones. They are given that name because they look rather like flowers when they put out their fringe of feelers—but really they are more like dahlias than anemones. When their feelers are not to be seen they look just like lumps of red-currant jelly. They cling to the rocks, and when they are hungry they fling out a circle of petal-like feelers round the top of their body, and wait for food.

These feelers sting any creature that comes too near, and then close over the victim, pushing him into the mouth that is in the centre of the feelers. The anemone feeds on the soft parts of the creature's body, and throws out the hard parts afterwards.

You do not need to be afraid of touching the sea-anemone, for it can only hurt tiny creatures. Feel it. It is just like a solid knob of jelly. When it wants to close up it squirts the water out of its body and folds its circle of feelers neatly inside.

There are three curious egg-cases I hope you will look for on the beach. You will be likely to find them after a storm, somewhere at high-water mark, among all the rubbish flung up by the sea.

The first is the egg-case of the skate. It is a big black case, oblong in shape, horned at each of the four corners. This case contained the egg of the skate fish.

The second is the egg-case of the dog-fish. It is very like the case of the skate, but has black tendrils at each corner, instead of horns. See if you can

find the slit in the case, showing where the baby fish made its escape into the sea.

The third thing is the funny papery ball made up of many small cells in which were once the eggs of the whelk. It is quite a big ball, and you can squeeze it as you do your sponge. Tear the ball to pieces and see the little rooms where the baby whelks grew.

I have no space to tell you of the shell-creatures you should look for—the cockles, the mussels, the limpets, the periwinkles and others. Hunt among the rocks and see how many you can find. You will discover many interesting things in your search.

THINGS TO DO

1. Look for all the things described, when you next go to the sea. If you think you are not going, you can easily look at shrimps, prawns, crabs, lobsters, whelks, scallops, winkles and so on in your fishmonger's shop.
2. Draw a shrimp or a prawn. Put underneath why it has two sets of legs.
3. Collect as many different sorts of shells as you can, and try to find out their names.
4. Collect such things as egg-cases of whelk, dogfish, skate, as well as shells. Draw them.
5. Write down what you know about one of these three things—the jelly-fish; the starfish; the hermit-crab.

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TRANSCRIBER NOTES

Mis-spelled words and printer errors have been fixed.
Inconsistency in hyphenation has been retained.
Some faded photographs have been enhanced.

[The end of *Round the Year with Enid Blyton—Summer Book* by Enid Blyton]